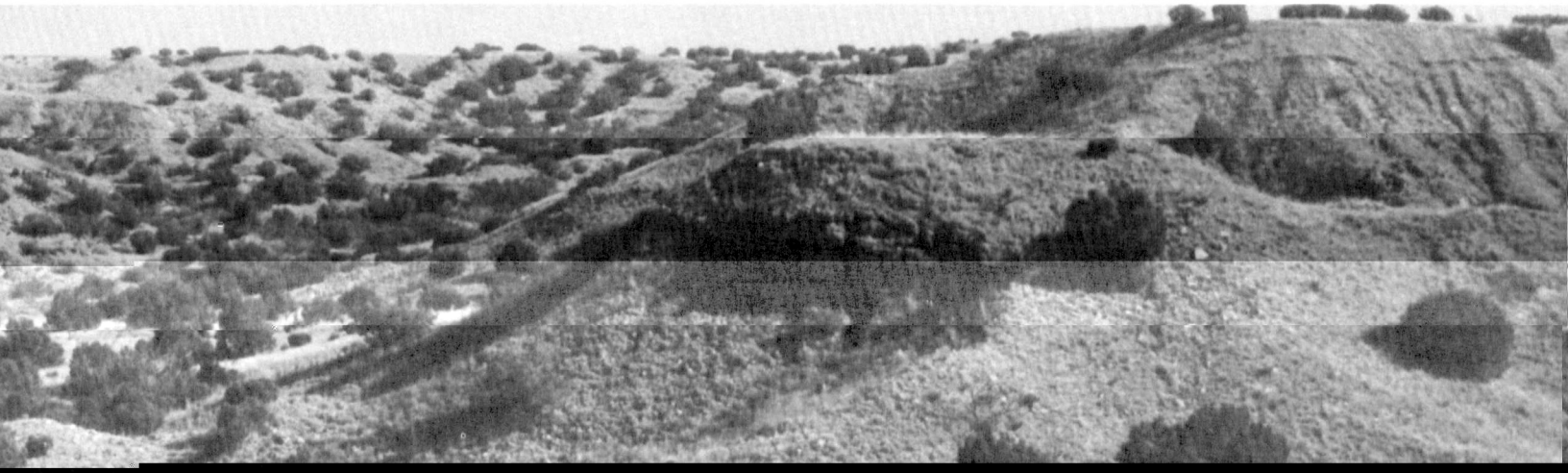
Soil Survey of

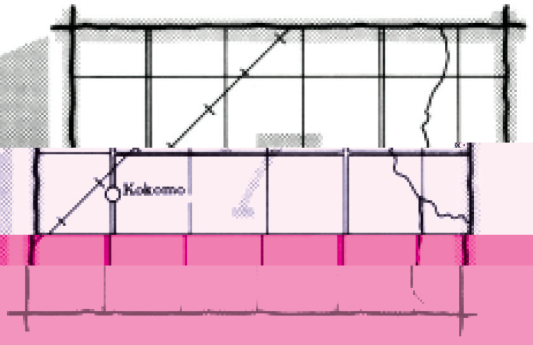
Donley County, Texas

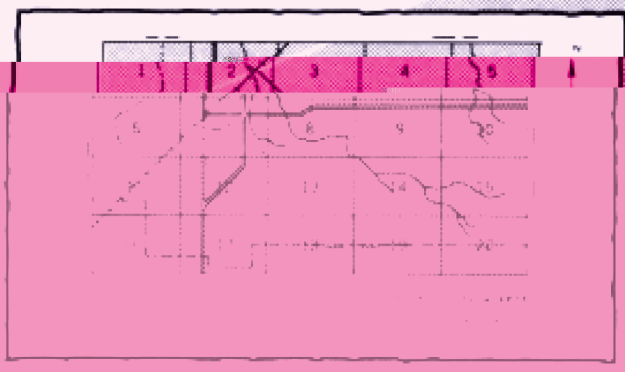
United States Department of Agriculture
Soil Conservation Service
in cooperation with
Texas Agricultural Experiment Station



HOW TO USE

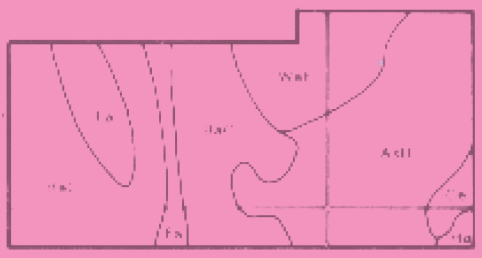
1. Locate your area of interest on the "Index to Map Sheets"

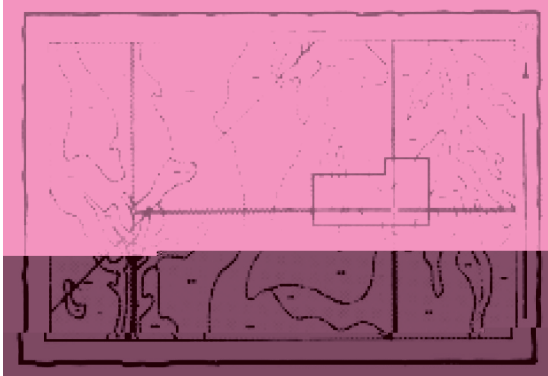




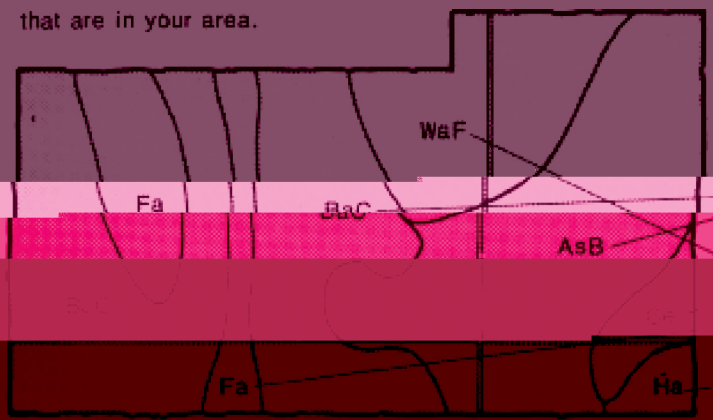
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area.

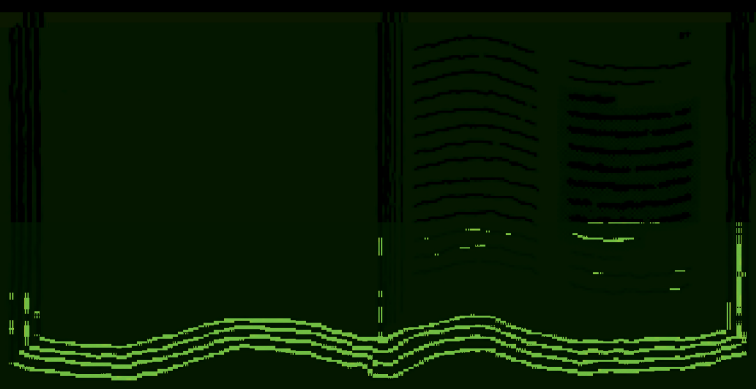


Symbols

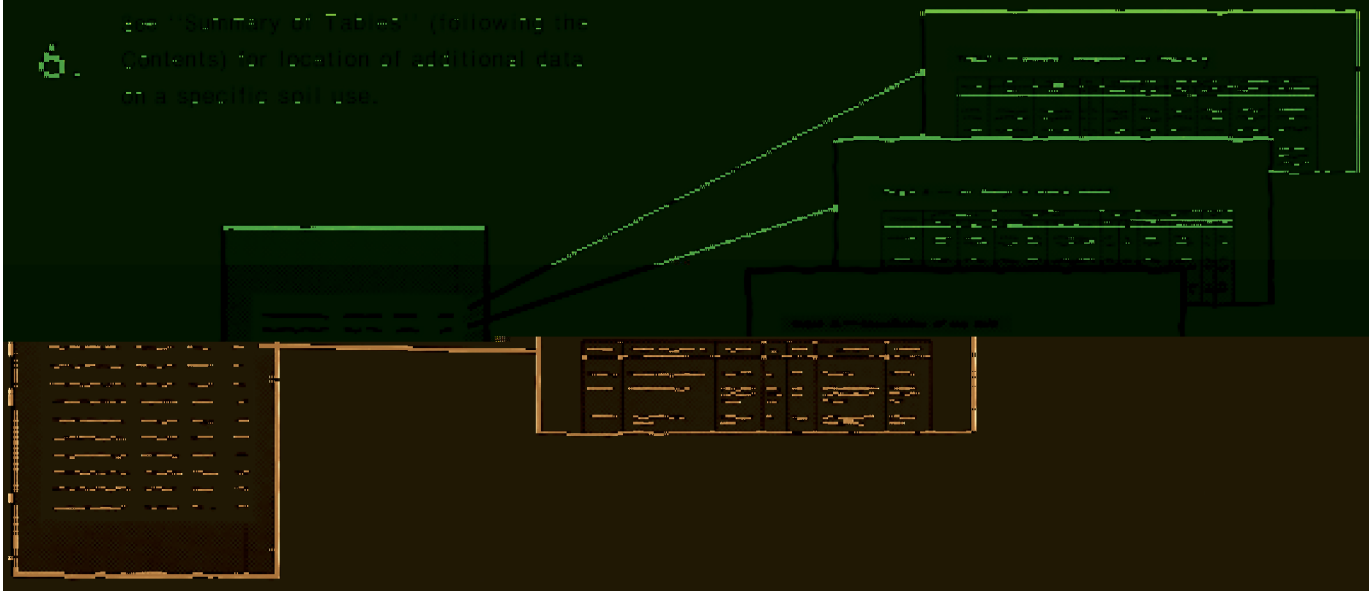
AsB
BaC
Ce
Fa
Ha
WaF

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.

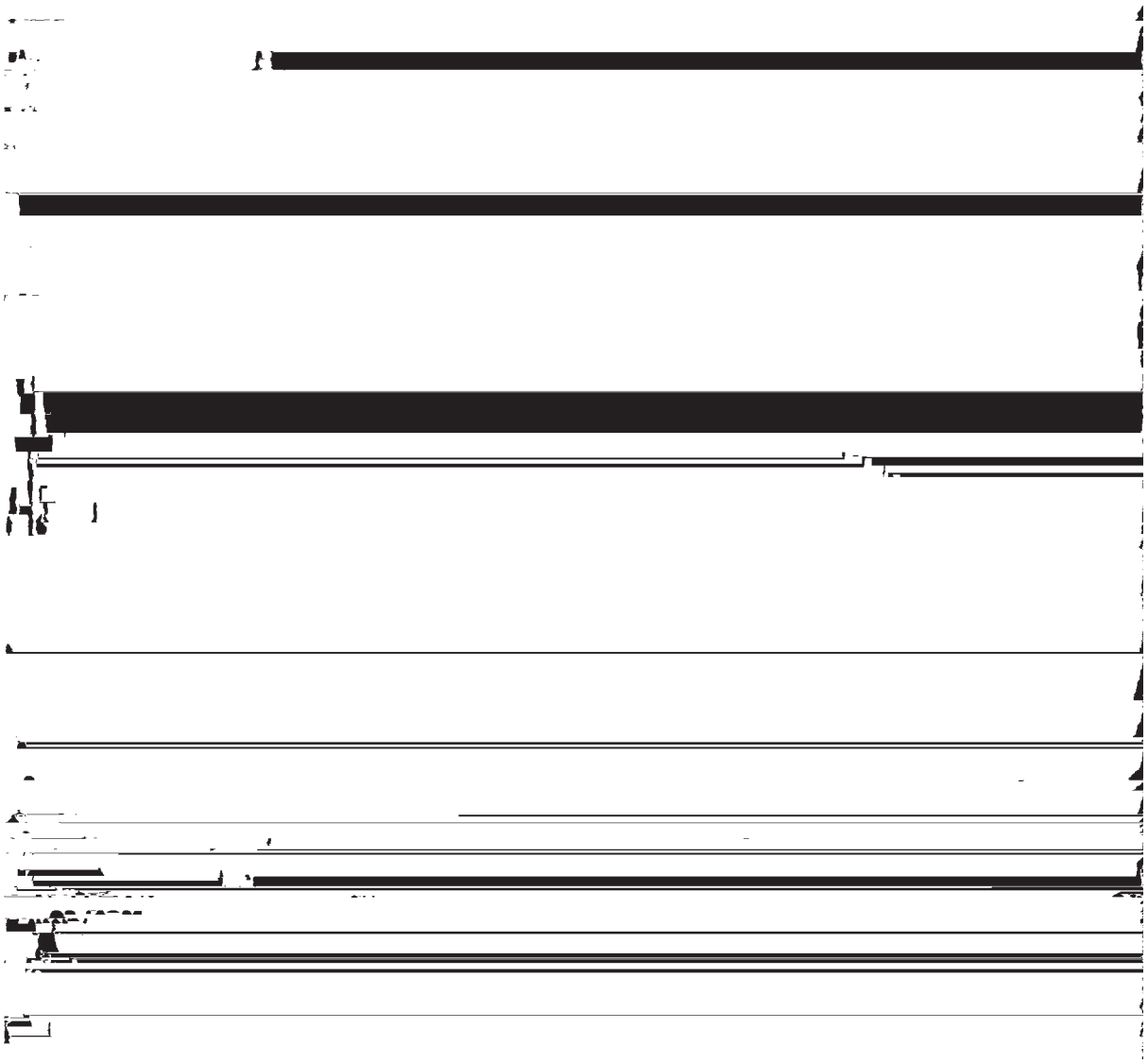


"Contents" preceds the publication that will meet your specific needs.

Consult

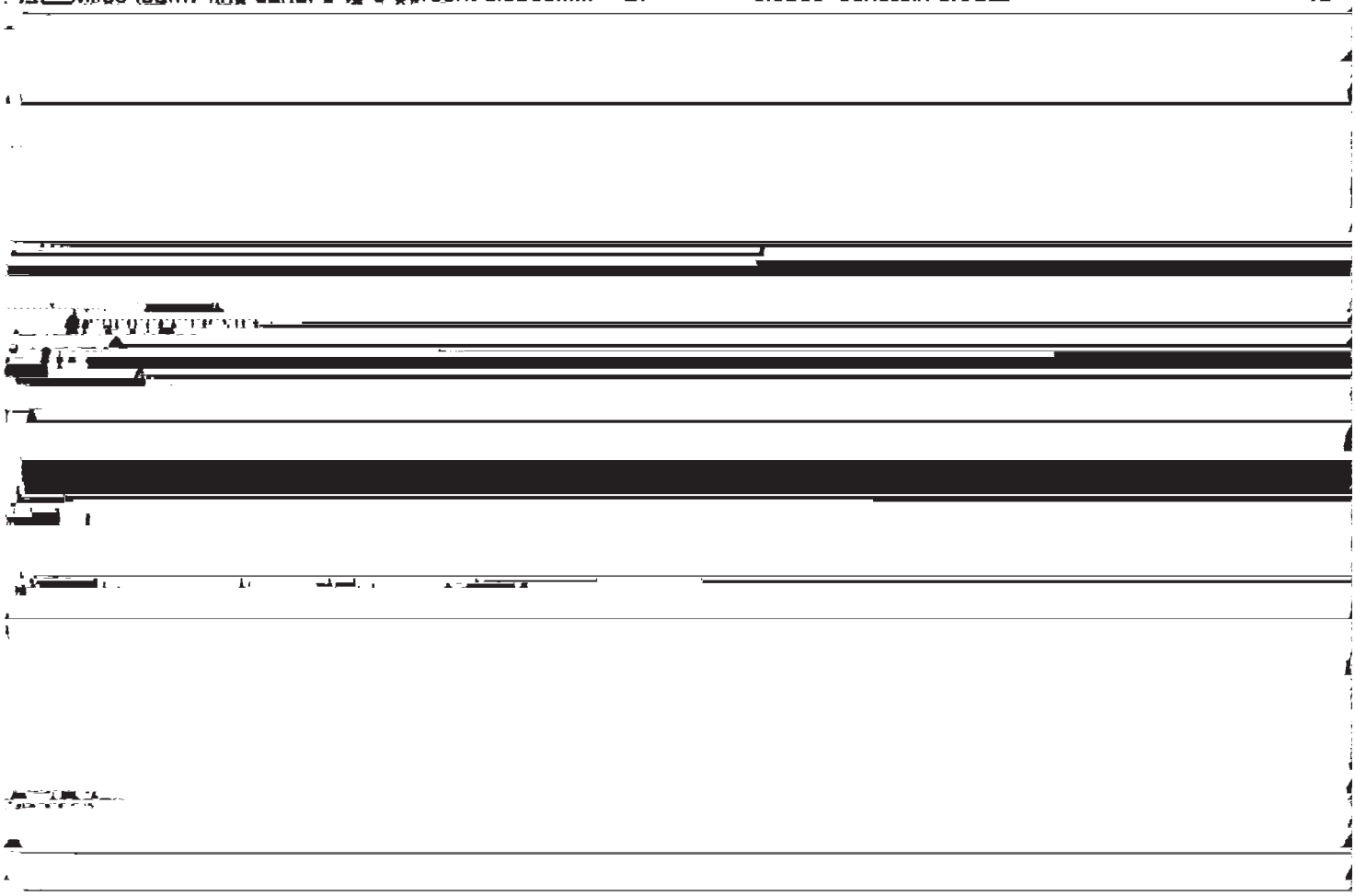
This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1969-1975. Soil names and descriptions were approved in 1975. Unless otherwise indicat-



Contents

Index to map units



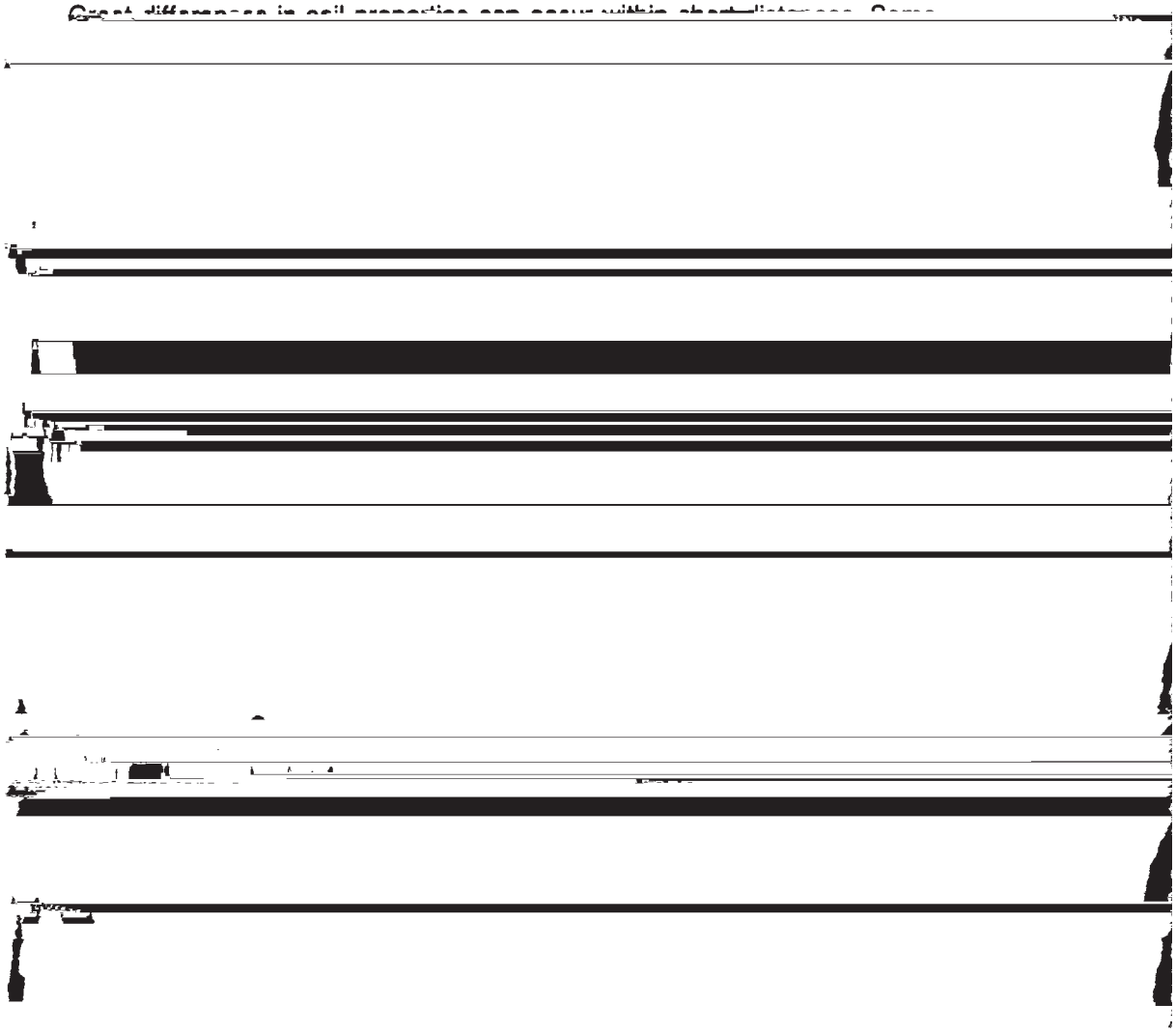
Summary of tables

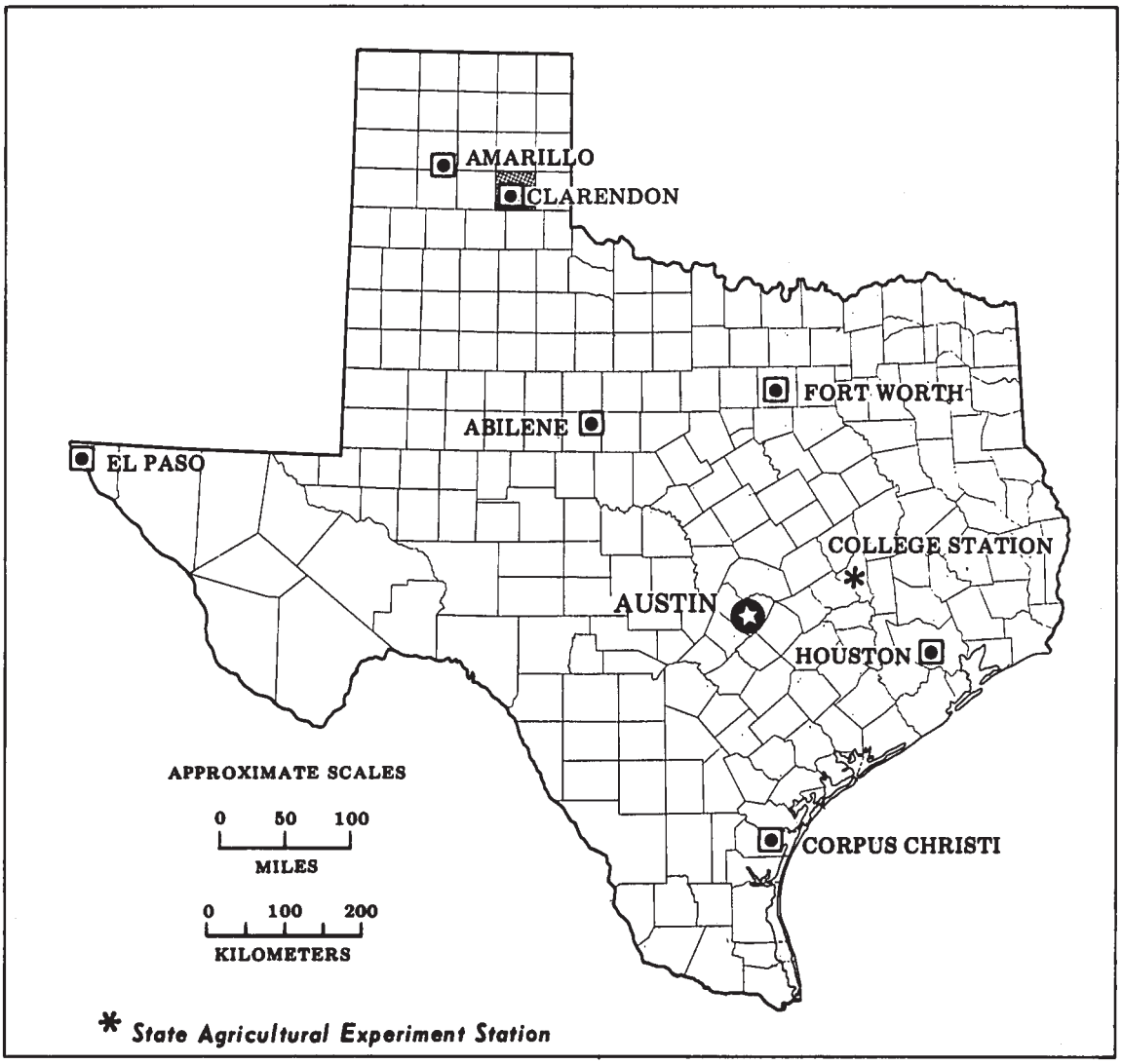
Foreword

This soil survey contains information that can be used in land-planning programs in Donley County, Texas. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some





Location of Donley County in Texas.

Soil Survey of Donley County, Texas

by Jack C. Williams and Jerald O. Crump,
Soil Conservation Service

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Texas Agricultural Experiment Station

DONLEY COUNTY is in the Texas Panhandle. It is in the Great Plains region; the northwestern part of the county is in the High Plains area, and the rest of the county is in the Rolling Plains area. The total area of the county is 581,760 acres, or 909 square miles. The survey area is mostly a nearly level to rolling plain that slopes upward in elevation from the southeast to the northwest. The elevation rises from about 2,075 feet above sea level near the southeastern corner of the county to about 3,265 feet in the northwestern corner.

Farming and ranching are the main enterprises in

In 1970, according to the census of that year, the population of Donley County was 3,641. Clarendon, the county seat, had a population of about 1,974. Other towns in the county are Hedley, which had a population of 439; Lelia Lake, 125; Howardwick, 110; and Ashtola, 20.

Greenbelt Lake, which is near Howardwick, provides waterbased recreation and supplies water to Clarendon and to several other cities. Rail transportation is provided by the Burlington and Northern Railroad and the Chicago, Rock Island, and Pacific Railroad. Federal and state

months, frequent masses of drier polar air enter the area from the north and northwest, minimizing the influence of the moist Gulf air; consequently, the period from Novem-

usually falls as light snow. In exceptionally wet years, high intensity rainfall of short duration can occur, causing rapid runoff and the resulting soil erosion. In 1960, the

Cotton, winter wheat, and grain sorghum are the main crops in the county. Raising livestock is a minor enterprise on the larger farms.

Natural resources

Soil is the most important natural resource in the

are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, rangeland managers, engineers, planners, developers and builders, home buyers, and others.

General soil map for broad land use planning

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Map unit descriptions

1. Mobeetie-Veal-Potter

Deep to very shallow, gently sloping to steep, loamy soils; on uplands

This map unit makes up about 33 percent of the county (fig. 1). The slopes range from 1 to 45 percent. Mobeetie soils make up about 41 percent of this unit, Veal soils 15 percent, Potter soils 11 percent, and minor soils 33 percent.

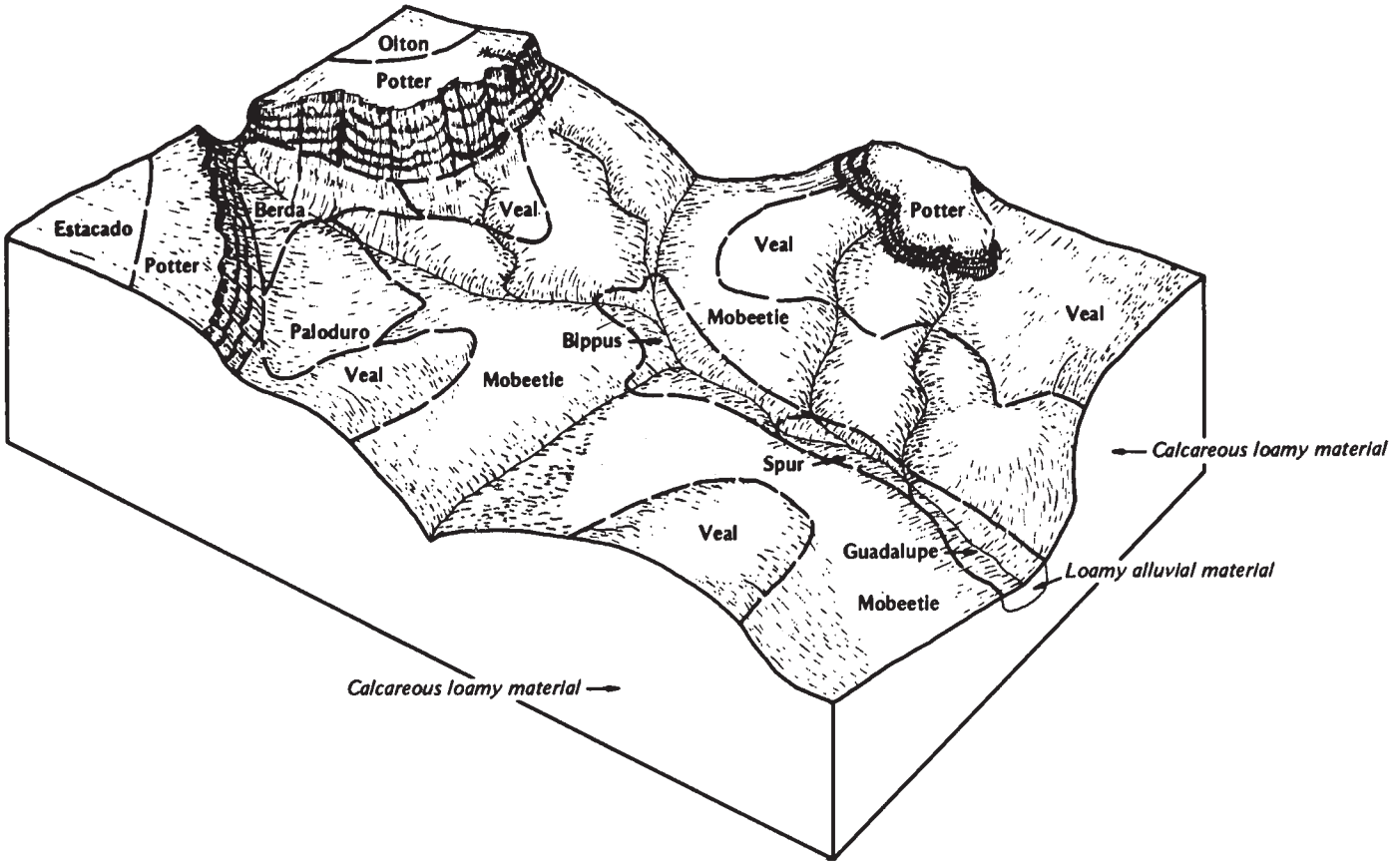


Figure 1.—Typical pattern of soils and parent material in the Mobeetie-Veal-Potter map unit.

Mobeetie soils are on uplands and have slopes of 1 to 45 percent. Typically, the surface layer is grayish brown fine sandy loam about 7 inches thick. The subsoil, to a depth of 20 inches, is pale brown fine sandy loam; to a depth of 35 inches, it is very pale brown fine sandy loam. The substratum, to a depth of 60 inches, is very pale brown fine sandy loam. The soil is very friable and mod-

This unit has medium potential for most urban uses. The main limitations are the steep slopes and the shallowness to bedrock. This unit has medium potential for recreation uses. The steep slopes and the small stones on the surface are limitations for camp areas, picnic areas, playgrounds, and paths and trails.

In a few areas, the caliche rock and gravel are mined

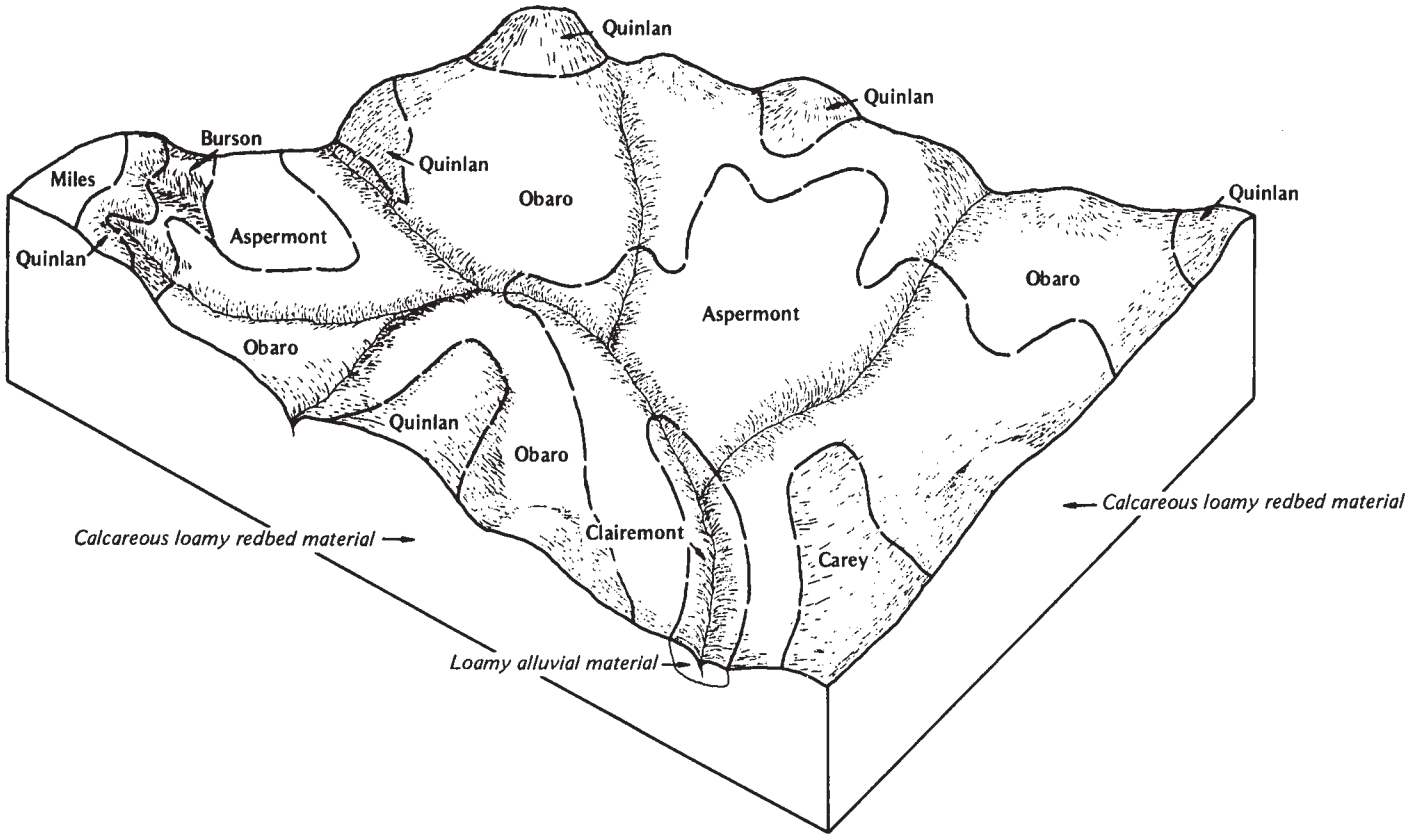


Figure 2.—Typical pattern of soils and parent material in the Obaro-Aspermont-Quinlan map unit.

ed, wheat, cotton, and grain sorghum are the main crops.

This unit has medium potential for use as rangeland. The steep slopes, shallowness to rock, and the hazard of water erosion limit the amount of forage that can be produced in favorable years. The native range plants are mainly short and mid grasses. In some areas, mesquite has invaded the rangeland.

This unit has medium potential for most urban uses. The main limitations are the steep slopes and the shallowness to bedrock.

This unit has medium potential for recreation uses. The steep slopes and the clay content of the surface layer are limitations for camp areas, picnic areas, playgrounds, and paths and trails.

In a few areas, the redbed material underlying these soils is mined for use in roadbeds.

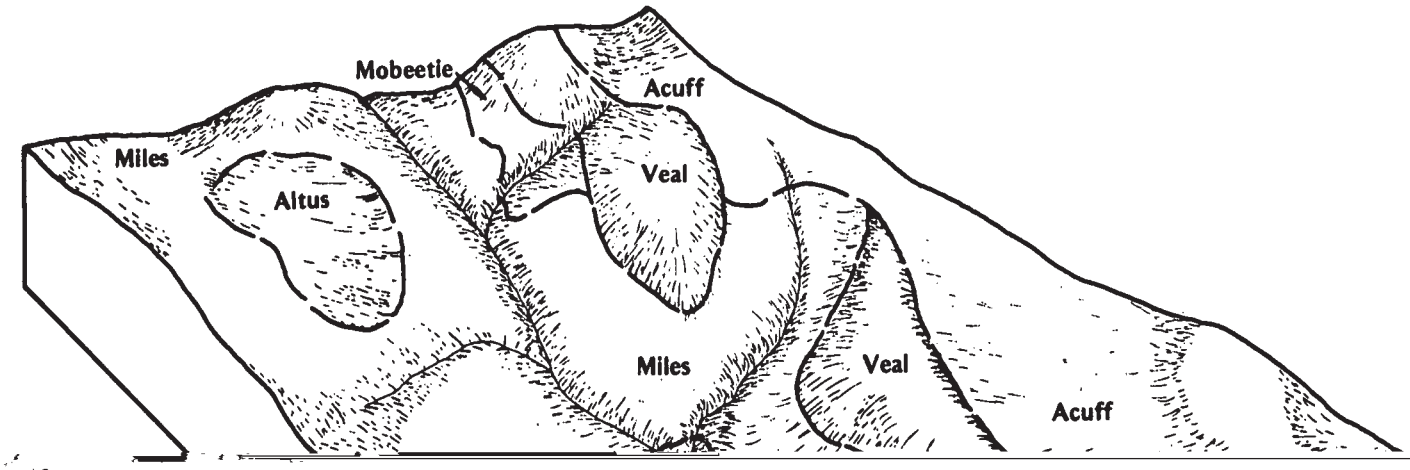
3. Miles-Veal-Acuff

Deep, nearly level to sloping, loamy soils; on uplands

This map unit makes up about 17 percent of the county (fig. 3). The slopes range from 0 to 5 percent. Miles soils make up about 63 percent of this unit, Veal soils 15 percent, Acuff soils 9 percent, and minor soils 13 percent.

Miles soils are on uplands and have slopes of 0 to 5 percent. Typically, the surface layer is very friable, brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 7 and 52 inches, it is friable, reddish brown sandy clay loam; to a depth of 72 inches, it is friable, yellowish red sandy clay loam; and to a depth of 80 inches, it is very friable, reddish yellow sandy clay loam. The soil is neutral to a depth of 28 inches, mildly alkaline between depths of 28 to 52 inches, and moderately alkaline below that.

Veal soils are on uplands and have slopes of 1 to 5 percent. Typically, the surface layer is very friable, grayish brown fine sandy loam about 6 inches thick. The subsoil, to a depth of 12 inches, is friable, brown sandy clay loam; to a depth of 26 inches, it is friable, pinkish gray sandy clay loam; and to a depth of 45 inches, it is friable, pink sandy clay loam. The substratum, to a depth of 80 inches, is friable, pink sandy clay loam. The soil is moderately alkaline throughout.


Mobeetie
Acuff
Miles
Veal
Altus
Miles
Veal
Acuff

This unit has high potential for most urban uses. The main limitations are low soil strength, corrosivity to uncoated steel, and the hazard of soil blowing. These limitations can be overcome through good design and careful installation.

This unit has high potential for recreation uses. The slope and the soil blowing hazard are limitations for some playgrounds.

4. Springer-Lincoln-Likes

Deep, nearly level to sloping, sandy soils; on uplands and bottom lands

This map unit makes up about 12 percent of the county (fig. 4). The slopes range from 0 to 8 percent. Springer soils make up about 33 percent of this unit,

inches and reddish brown below that. The subsoil, to a depth of 28 inches, is very friable, yellowish red fine sandy loam; to a depth of 40 inches, it is very friable, reddish yellow fine sandy loam. The layer below that, which extends to a depth of 48 inches, is loose, reddish yellow loamy fine sand. To a depth of 60 inches, the soil material is very friable, yellowish red sandy clay loam, and, to a depth of 72 inches, it is very friable, yellowish red fine sandy loam. The soil is neutral to a depth of 16 inches and mildly alkaline below that.

Lincoln soils are on bottom lands and have slopes of 0 to 1 percent. Typically, the surface layer is brown loamy fine sand about 8 inches thick. The underlying material, to a depth of 25 inches, is light yellowish brown loamy fine sand; to a depth of 38 inches, it is pale brown

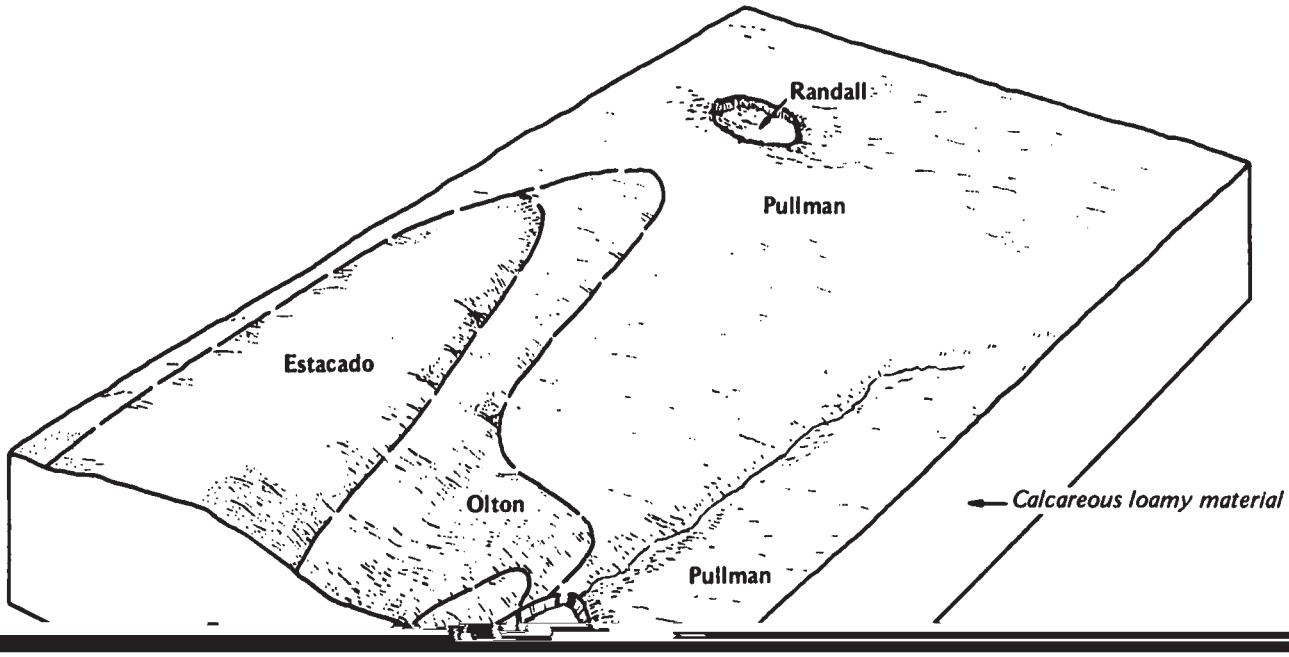
sand about 8 inches thick. The underlying material, to a depth of 28 inches, is brown loamy fine sand; to a depth of 66 inches, it is pink loamy fine sand. The soil is very

capacity, and the hazard of soil blowing. The main crops are hay, pasture grasses, and sorghum.

This unit has medium potential for use as rangeland.

Miles soils make up about 55 percent of this unit, Spring-

6. Pullman-Estacado-Olton


Randall
Pullman
Estacado
Olton
Pullman
Calcareous loamy material

inches, mildly alkaline between depths of 6 and 13 inches, and moderately alkaline below that.

Miles soils are on uplands and have slopes of 0 to 5 percent. Typically, the surface layer is very friable, brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 7 and 52 inches, it is friable, reddish brown sandy clay loam; to a depth of 72 inches, it is friable, yellowish red sandy clay loam; and, to a depth of 80 inches, it is very friable, reddish yellow sandy clay loam. The soil is neutral to a depth of about 28 inches, mildly alkaline between depths of 28 and 72 inches, and moderately alkaline below that.

This map unit is used as rangeland and for cultivated crops.

This unit has high potential for cultivated crops; however, the low rainfall and the insufficient supply of irrigation water limit the acreage that can be cultivated. Cotton, grain sorghum, and wheat are the main crops.

This unit has high potential for use as rangeland. The yield of short and mid grasses is good in favorable years.

This unit has high potential for most urban uses. The main limitations are the low soil strength and corrosivity to uncoated steel, but they can easily be overcome through good design and careful installation.

This unit has high potential for recreation uses. The slopes are a limitation for some playgrounds

cado, Randall, Springer, and Veal soils. Berda soils are deep, sloping, loamy soils on uplands. Estacado soils are deep, nearly level to gently sloping, loamy soils on uplands. Randall soils are deep, nearly level, clayey soils on the bottom of playas. Springer and Veal soils are deep, gently sloping, loamy soils on convex uplands.

Broad land use considerations

The soils in the survey area vary widely in their potential for major land uses. Table 2 shows the extent of the

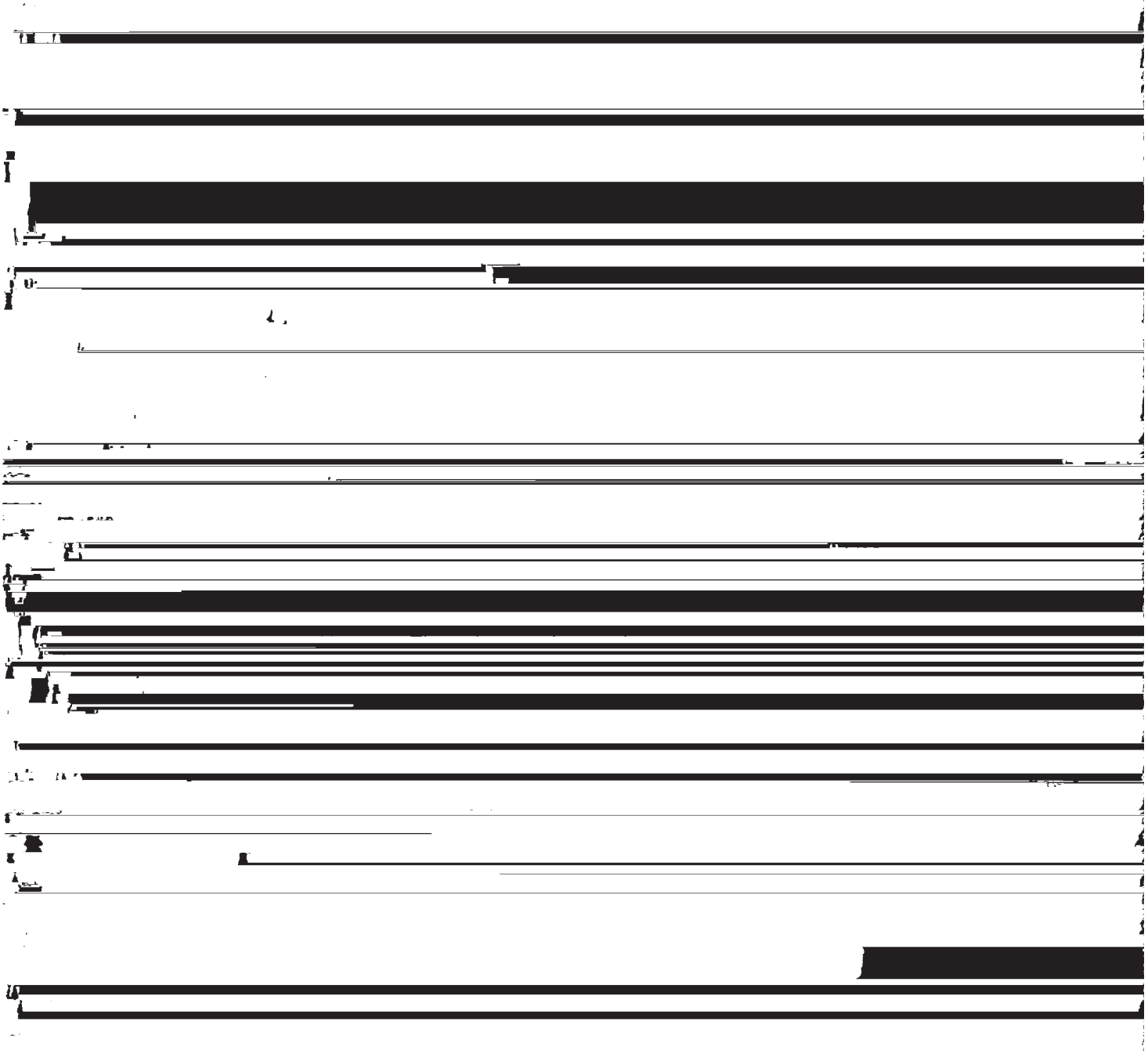
map units shown on the general soil map. It lists the potential of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil potential ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

Each map unit is rated for *cultivated crops, specialty crops, rangeland, urban uses,* and *recreation areas*. Cultivated crops are those grown extensively in the survey

The sandy soils in the Springer-Lincoln-Likes map unit have low potential for most uses. Soil blowing and slope are the main limitations.

Soil maps for detailed planning

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil



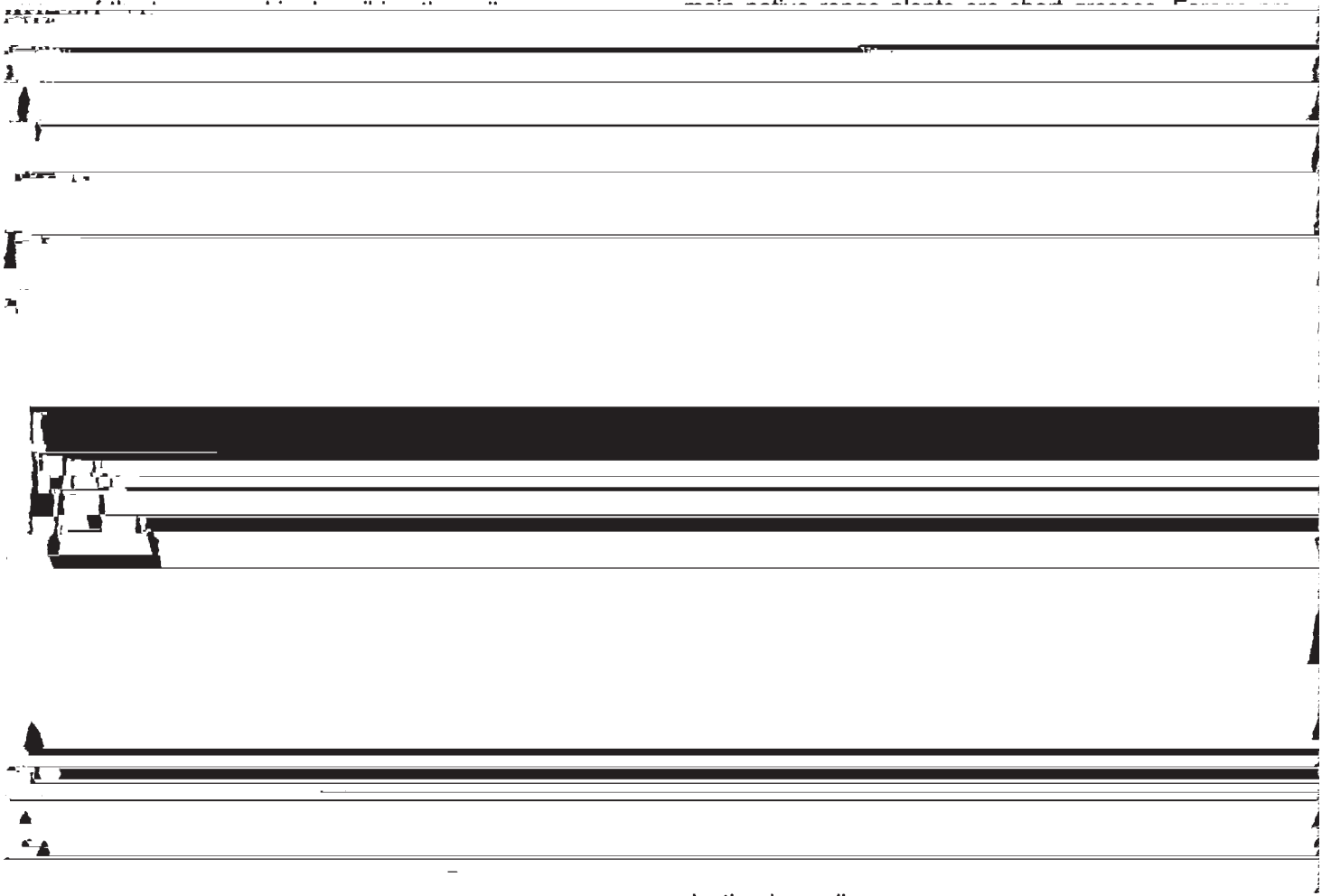
be made up of only one of the major soils, or it can be made up of all of them. Sweetwater soils is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description.

Table 3 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines

water erosion can be controlled and moisture conserved by leaving crop residue on the surface, through timely and limited tillage, and by rotating crops. Leaving crop residue on the surface also helps to maintain the productivity of this soil. If the crop residue or cover crops cannot provide adequate protection, emergency tillage to roughen the soil surface is needed to help control soil blowing. If this soil is irrigated, an irrigation system that properly applies irrigation water should be used. Surface and sprinkler irrigation systems are suitable. Fertilizer will be needed if this soil is irrigated.

This soil has medium potential for native range plants. Its potential is limited because the amount of water available to plants during the growing season is low. The



Soil descriptions

1—Acuff loam, 0 to 1 percent slopes. This is a deep, well drained, nearly level soil on uplands. The areas are irregular in shape and range from 10 to 100 acres.

duction is medium.

This soil has medium potential for the development of wildlife habitat.

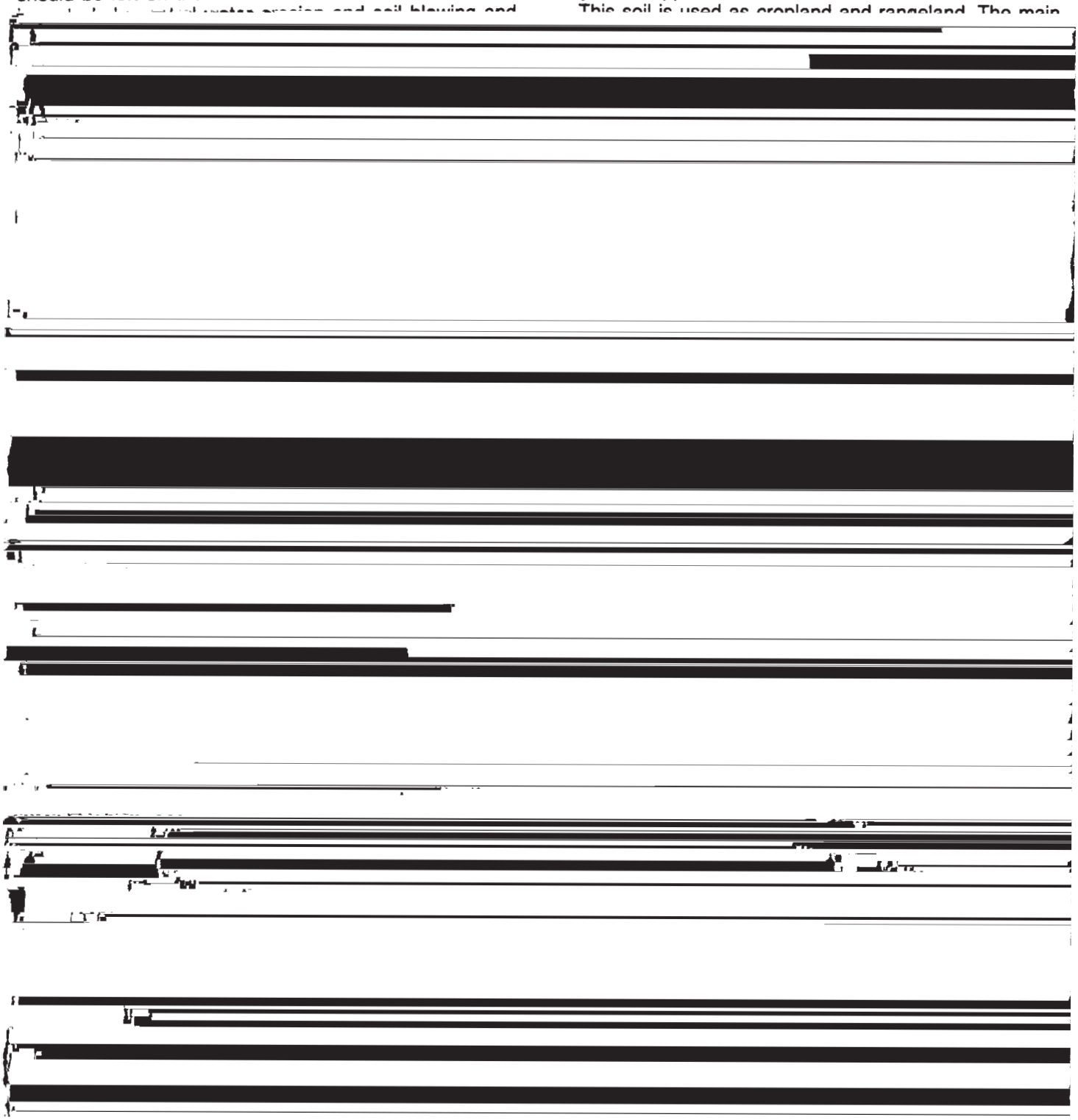
This soil has high potential for most urban uses. The main limitations are the moderate corrosivity to uncoated steel and low soil strength, but they can easily be overcome through good design and careful installation.

This soil has high potential for recreation uses.

This soil has medium potential for nonirrigated and irrigated cotton, wheat, and grain sorghum. Crop residue should be left on the surface or worked into the surface

areas of Acuff soils that have slopes of 1 to 3 percent. These included soils make up less than 25 percent of any one mapped area.

This soil is used as cropland and rangeland. The main



Water erosion is a slight hazard, and soil blowing is a moderate hazard.

Included in mapping are small areas of Acuff and Miles soils. Also included are small areas of Altus soils that have slopes of 1 to 3 percent. The included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton and grain sorghum. Wheat is grown in some areas.

This soil has high potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. Crop residue should be left on the surface or worked into the surface layer to conserve moisture and to help control soil blowing and water erosion. In dry years, emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Diversion terraces and grassed waterways can be used to control runoff from adjacent soils. If this soil is irrigated, an irrigation system that properly applies irrigation water is necessary. A surface or sprinkler irrigation system can be used. Fertilizer will be needed if this soil is irrigated.

This soil has high potential for native range plants. Low rainfall is the main limitation.

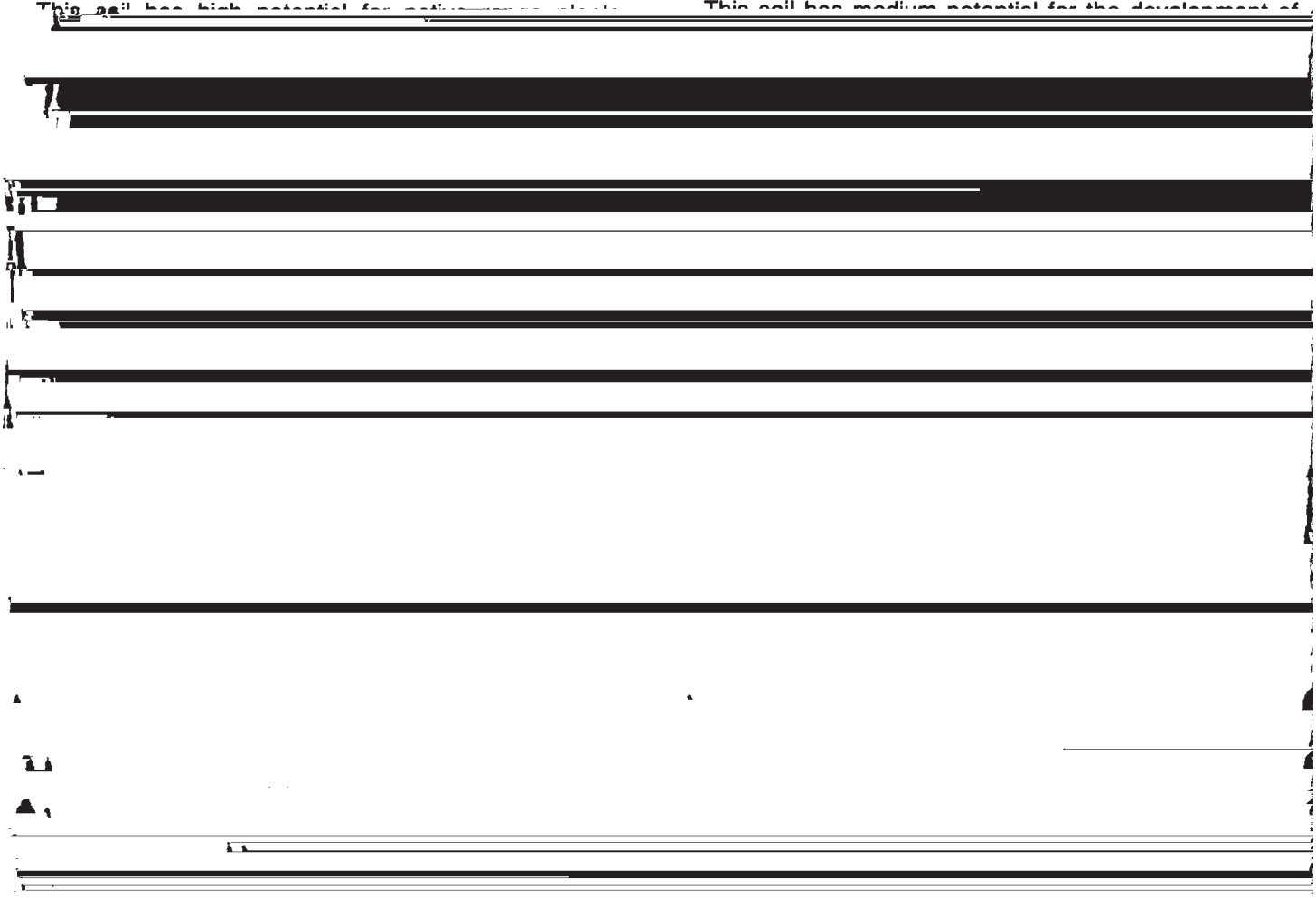
This soil has medium potential for the development of

percent or 3 to 5 percent. The included soils make up less than 20 percent of any one mapped area.

This soil is used mainly as rangeland. In a few areas, it is cultivated; wheat, cotton, and grain sorghum are the main crops.

This soil has medium potential for nonirrigated and irrigated wheat, cotton, and grain sorghum. Crop residue should be left on the surface or worked into the surface layer to help control water erosion and soil blowing and to conserve moisture. In dry years, emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Contour farming, terraces, and grassed waterways are needed to help control water erosion. If this soil is irrigated, an irrigation system that properly applies irrigation water is necessary. A sprinkler or surface irrigation system can be used. If a surface system is used, bench leveling will be necessary. Fertilizer will be needed if this soil is irrigated.

This soil has low potential for native range plants. Low rainfall is the main limitation.



This soil is used mainly as rangeland. In a few areas it is cultivated; the main crops are grain sorghum and wheat. Cotton is grown in some areas.

This soil has low potential for nonirrigated and irrigated grain sorghum, cotton, and wheat. The main limitations are the low rainfall, the slope, and the hazard of water erosion. If this soil is cultivated, crop residue needs to be left on the surface or worked into the surface layer to conserve moisture and to help control water erosion and soil blowing. Emergency tillage is needed in dry years if the crop residue cannot provide adequate protection. Contour farming, terraces, and grassed waterways are necessary to help control runoff. If this soil is irrigated, an irrigation system that properly applies irrigation water is necessary. A sprinkler or surface irrigation system can be used. If a surface system is used, bench leveling will be necessary. Fertilizer will be needed if this soil is irrigated.

layer is friable, dark brown clay loam about 14 inches thick. The subsoil, to a depth of 22 inches, is friable, brown clay loam that is about 25 percent calcium carbonate, by volume; to a depth of 38 inches, it is friable, yellowish red clay loam that is about 10 percent calcium carbonate, by volume; to a depth of 52 inches, it is firm, yellowish red clay loam that is about 15 percent calcium carbonate, by volume; and, to a depth of 65 inches, it is friable, yellowish red clay loam that is about 30 percent calcium carbonate, by volume. The soil is moderately alkaline throughout.

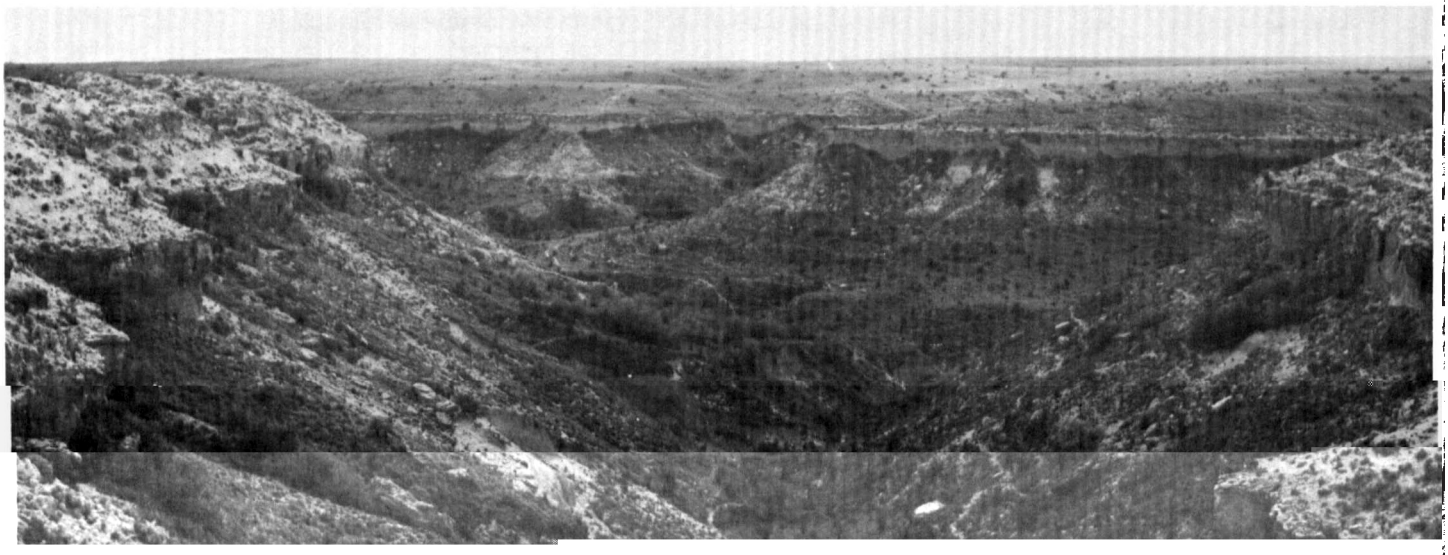
Runoff is medium. Permeability is moderate, and the available water capacity is medium. The root zone is deep. Water erosion and soil blowing are moderate hazards.

Potter soils are well drained and are in strongly convex areas and on ridges along escarpments. The surface layer is friable, light brown loam about 5 inches thick.

geologic erosion is active (fig. 8). The areas range from 10 to about 200 acres. Slopes range from 20 to 45 percent. Relief ranges from 30 to 150 feet. This association is about 50 percent Berda soils, 20 percent Potter soils, 15 percent Rock outcrop, and 15 percent minor soils.

Berda soils are on hillsides and below escarpments. The surface layer is friable, brown clay loam about 11

Potter soils are in strongly convex areas and on ridges along escarpments. The surface layer is about 9 inches thick. The upper part is brown gravelly loam about 4 inches thick, and the lower part is light brown very gravelly loam about 5 inches thick. The underlying material, to a depth of 12 inches, is light brown, extremely gravelly loam that has soft calcium carbonate accumulations be-



are almost void of vegetation. Runoff is very rapid, and geologic erosion is active.

Included in mapping are small areas of Acuff, Bippus, Guadalupe, Likes, Lincoln, Miles, Mobeetie, Polar, Spur, and Veal soils. Slopes are mainly 20 to 45 percent but

This soil has high potential for nonirrigated and irrigated cotton, wheat, and grain sorghum. Crop residue should be left on the surface or worked into the surface layer to help protect the soil from soil blowing and to conserve moisture. Contour farming and terraces are

This soil has medium potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. Crop residue should be left on the surface or worked into the surface layer to conserve moisture and to help prevent water erosion and soil blowing. Contour farming and terraces are needed to reduce runoff. Diversion terraces and grassed waterways can be used to help control runoff from adjacent soils. If this soil is irrigated, an irrigation system that properly applies irrigation water is necessary. A surface or sprinkler irrigation system can be used. If a surface system is used, bench leveling will be necessary. Fertilizer will need to be applied if this soil is irrigated.

This soil has high potential for native range plants. The yield of short and mid grasses is high in favorable years.

This soil has high potential for the development of wildlife habitat.

This soil has low potential for urban uses mainly be-

inches, is firm, yellowish red silty clay loam. The soil is moderately alkaline throughout.

Runoff is rapid. Permeability is moderate, and the available water capacity is high. The root zone is deep. Soil blowing is a moderate hazard, and water erosion is a severe hazard.

Included in mapping are small areas of Clairemont, Likes, Lincoln, Obaro, Polar, and Quinlan soils. Also included are areas of Rock outcrop along escarpments and areas of Badland below the escarpments. Inclusions make up less than 50 percent of any one mapped area.

The soils in this association are used mainly as rangeland. They are not suitable for cultivation.

These soils have low potential for native range plants because of the rapid runoff, the high to very low available water capacity, and the very shallow root zone of the Burson soils. Forage production is low in favorable years.

Figure 9.—An area of Burson-Aspermont association, steep.

percent. The included soils make up less than 20 percent of any one mapped area.

[redacted]

the main crop. Grain sorghum and wheat are grown in some areas.

[redacted]

small areas of Carey soils that have slopes of 0 to 1 percent. Also included are a few U-shaped gullies ex-

[redacted]

less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main

[redacted]

The included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat.

This soil has high potential for nonirrigated cotton, grain sorghum, and wheat. The hazard of occasional flooding is the main limitation. Crop residue should be left on the surface or worked into the surface layer to help control soil blowing and to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. In some areas, diversion terraces are needed to control the runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions and terraces. If this soil is irrigated, an irrigation system that properly applies

and shin oak motts. The included soils make up less than 25 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton and grain sorghum. Alfalfa is grown in some areas (fig. 10).

This soil has medium potential for nonirrigated and irrigated cotton, wheat, or grain sorghum. Crop residue should be left on the surface or worked into the surface layer to help prevent soil blowing. Emergency tillage can be used to help control soil blowing if the crop residue cannot provide adequate protection. Deep plowing can increase the clay content in the surface layer. Diversion terraces and grassed waterways help to control excessive runoff. If this soil is cultivated, fertilizer will be needed. Under irrigation management, an irrigation system that properly applies irrigation water is necessary.

Figure 10.—Irrigated cropland in an area of Delwin fine sand, 0 to 3 percent slopes. The crop is alfalfa.

This soil has medium potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. Crop residue needs to be left on the surface to help control soil blowing and water erosion, to conserve moisture, and to help maintain the productivity of this soil. If crops do not produce enough residue to protect the soil, emergency tillage to roughen the soil surface will be necessary to reduce soil blowing. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A surface or sprinkler irrigation system is suitable. Fertilizer will need to be applied if this soil is irrigated.

This soil has medium potential for native range plants. The low rainfall limits forage production. The main native range plants are short grasses, and forage production is medium.

This soil has medium potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The main limitations are the moderate corrosivity to uncoated steel and the low strength of the soil. They can easily be overcome through good design and careful installation.

This soil has medium potential for recreation uses. The clay loam texture of the surface layer is the main limitation.

Capability subclass IIIe, nonirrigated, and IIe, irrigated; Loamy range site.

17—Estacado clay loam, 1 to 3 percent slopes. This is a deep, well drained, gently sloping soil on uplands (fig. 11). The areas are irregular to elongated in shape and range from 5 to 30 acres.

The surface layer is about 15 inches thick. The upper part is dark brown clay loam about 5 inches thick, and the lower part is dark grayish brown clay loam about 10 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 15 and 24 inches, it is brown clay loam; to a depth of 55 inches, it is pink clay loam that is about 35 percent calcium carbonate, by volume; and to a depth of 80 inches, the subsoil is reddish yellow clay loam that is about 15 percent calcium carbonate, by volume. The soil is friable and moderately alkaline throughout.

Runoff is medium. Permeability is moderate, and the available water capacity is medium. The root zone is deep, and the soil material is easily penetrated by plant roots. Water erosion and soil blowing are moderate hazards.

Included in mapping are small areas of Acuff, Olton, Paloduro, Pullman, and Veal soils. Also included are small areas of Estacado soils that have slopes of 0 to 1 percent or 3 to 5 percent. The included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, wheat, and grain sorghum.

This soil has medium potential for nonirrigated and irrigated wheat, grain sorghum, and cotton. Crop residue needs to be left on the surface or worked into the surface layer to help protect this soil against water erosion

places, the slope is a limitation for playgrounds.

Capability subclass IIIe, nonirrigated and irrigated; Loamy range site.

18—Estacado clay loam, 3 to 5 percent slopes. This is a deep, well drained, gently sloping soil on uplands. The areas are irregular to elongated in shape and range from 5 to 40 acres.

The surface layer is friable, dark grayish brown clay loam about 10 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 10 and 15 inches, it is friable, brown clay loam; and to a depth

tween depths of 15 and 30 inches, the subsoil is about 25 percent calcium carbonate, by volume, and below that, it is about 10 percent calcium carbonate, by volume. The soil is moderately alkaline throughout.

Runoff is medium. Permeability is moderate, and the

This soil has medium potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The main limitations are the low soil strength and the moderate corrosivity to uncoated steel.

This soil has medium potential for recreation uses. The clay loam texture of the surface layer is a limitation. The slope is a limitation for some playgrounds.

Capability subclass IVe, nonirrigated and irrigated; Loamy range site.

19—Guadalupe fine sandy loam, occasionally flooded. This is a deep, well drained, nearly level soil on bottom lands (fig. 12). Slopes are 0 to 1 percent. The areas generally are less than 1,000 feet wide and are elongated along drainageways. This soil is flooded for a few hours about once in 1 to 5 years.

The surface layer is brown fine sandy loam about 9 inches thick. The subsoil, to a depth of 24 inches, is very pale brown fine sandy loam; to a depth of 34 inches, it is light brown fine sandy loam. The substratum, to a depth of 50 inches, is very pale brown fine sandy loam; to a depth of 65 inches, it is very pale brown loamy fine sand that has distinct stratification. The soil is very friable and moderately alkaline throughout.

Runoff is slow. Permeability is moderately rapid, and the available water capacity is medium. The root zone is deep, and the soil material is easily penetrated by plant roots. Soil blowing is a moderate hazard.

Included in mapping are small areas of Bippus, Clairemont, Lincoln, Mobeetie, Paloduro, Spur, Sweetwater, and Tivoli soils. Also included are small areas that are

Figure 12.—An area of Guadalupe fine sandy loam, occasionally flooded, on bottom lands.

dissected by stream channels and a few soils that have a water table within a depth of 40 inches for a few months each year. These inclusions make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat.

This soil has high potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. The hazards of occasional flooding and soil blowing are the main limitations. Crop residue should be left on the surface or worked into the surface layer to help control soil blowing and to conserve moisture. Emergency tillage will be

This soil has medium potential for native range plants. The main limitations are the low rainfall and the severe hazard of soil blowing. The main native range plants are mid and tall grasses. Forage production is medium in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has medium potential for most urban uses. Excessive seepage is the main limitation.

This soil has low potential for recreation uses mainly because of the sandy texture of the surface layer.

Capability subclass VIe, nonirrigated; Loamy Sand range site

provide adequate protection. In some areas, diversion terraces are needed to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diver-

21—Lincoln loamy fine sand, frequently flooded. This is a deep, somewhat excessively drained, nearly level soil on bottom lands. Slopes are 0 to 1 percent.

thinned by soil blowing. In places in some fields, soil blowing has removed all of the surface layer. Also as a result of soil blowing, sand has accumulated along most field boundaries and fence rows. The accumulations are 10 to 30 feet wide and are as much as 3 feet deep. A few shallow washes are in natural watercourses on slopes of 2 to 3 percent.

The surface layer is very friable, neutral, light reddish brown loamy fine sand about 7 inches thick. The subsoil, to a depth of 17 inches, is friable, mildly alkaline, mixed reddish brown sandy clay loam and loamy fine sand; to a

of seepage, and they can easily be overcome through good design and careful installation.

This soil has medium potential for recreation uses. The loamy fine sand texture of the surface layer is the main limitation. The slope is a limitation for some playgrounds.

Capability subclass IIIe, nonirrigated and irrigated; Loamy Sand range site.

23—Miles loamy fine sand, 3 to 5 percent slopes. This is a deep, well drained, gently sloping soil on undu-

that properly applies irrigation water is necessary. A sprinkler or drip irrigation system is suitable.

This soil has high potential for native range plants. The low rainfall and the slope are the main limitations. The main native range plants are mid and tall grasses.

subsoil is friable, reddish yellow sandy clay loam. The soil is neutral to a depth of 38 inches and mildly alkaline below that.

Runoff is medium. Permeability is moderate, and the available water capacity is medium. The root zone is

soils. Also included are a few soils that have a browner subsoil, soils that have significantly less clay within a depth of 60 inches, and a few soils that have a dark buried horizon below a depth of 40 inches. Also included are small areas of Miles soils that have slopes of 1 to 3 percent and small areas of Miles loamy fine sand. The included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton and grain sorghum. Wheat is grown in some areas.

This soil has high potential for nonirrigated cotton, grain sorghum, and wheat. The main limitations are the low rainfall and the hazard of soil blowing. Crop residue

deep, and the soil material is easily penetrated by plant roots. Water erosion and soil blowing are moderate hazards.

Included in mapping are small areas of Acuff, Altus, Polar, and Veal soils. Also included are a few soils that have significantly less clay or are grayer in color below a depth of 60 inches, soils that have a dark buried horizon, soils that have lime accumulations within a depth of 60 inches, and soils that have a browner subsoil. Also included are small areas of Miles soils that have slopes of 0 to 1 percent or 3 to 5 percent and small areas of Miles loamy fine sand. The included soils make up less than 25 percent of any one mapped area.

This soil is used as cropland and rangeland (fig. 13).

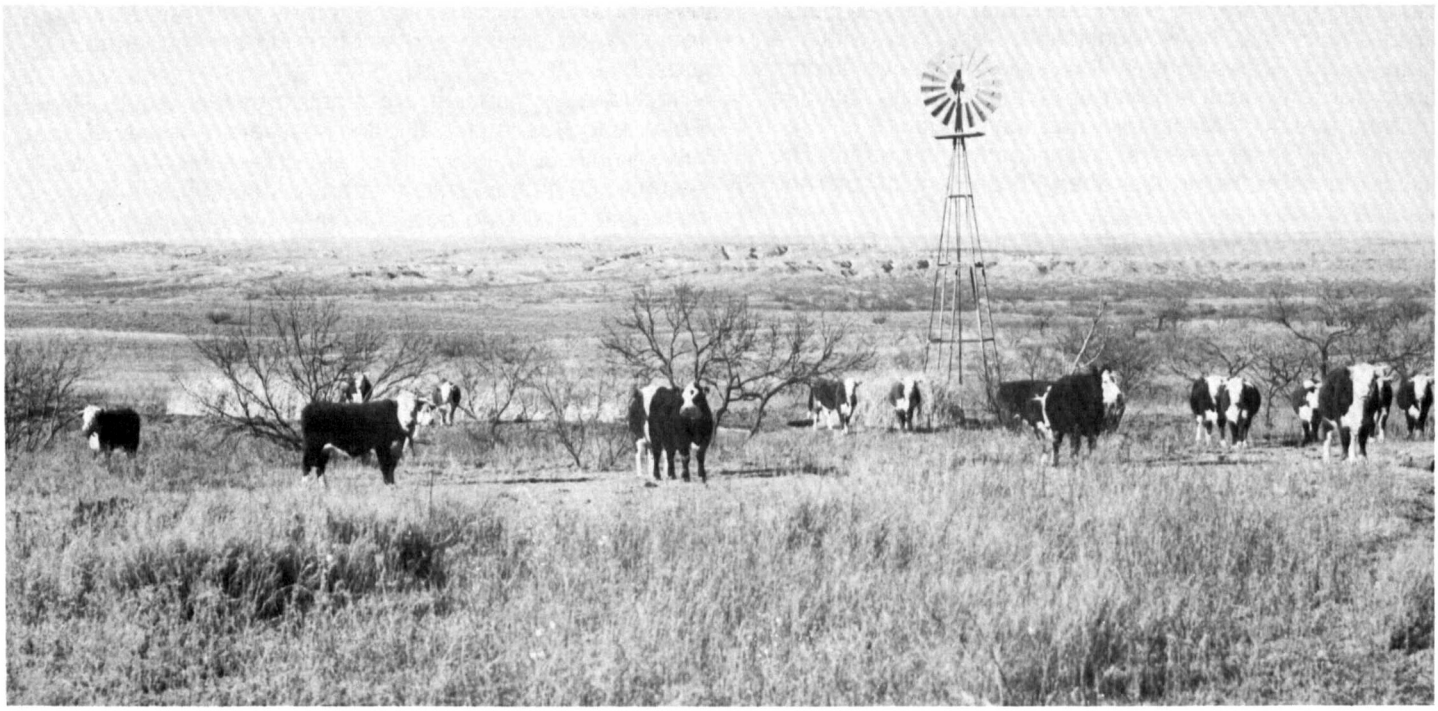
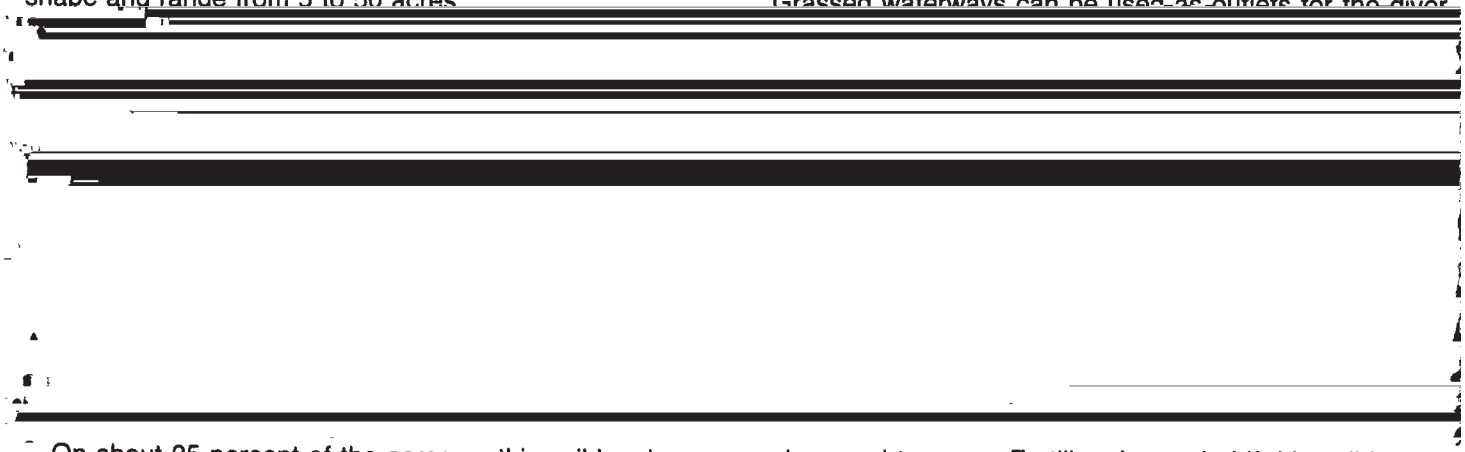


Figure 13.—Rangeland in an area of Miles fine sandy loam, 1 to 3 percent slopes. This soil is in the Sandy Loam range site.

The surface layer is very friable, brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 7 and 35 inches it is friable, reddish brown sandy clay loam; and

help control water erosion and soil blowing and to conserve moisture. Emergency tillage will be needed to help control soil blowing if the crop residue cannot provide adequate protection. Contour farming and terrace

on gently undulating uplands. The areas are irregular in shape and range from 5 to 50 acres.



On about 25 percent of the acreage, this soil has been slightly eroded by wind and water. On about 17 percent of the acreage, the original surface layer has been lost through erosion, and the surface texture is sandy clay loam. On about 50 percent of the acreage, most of the original surface layer has been lost, and the surface texture is sandy clay loam or fine sandy loam.

Gullies that extend into the subsoil are about 80 feet apart across the slopes. Of these gullies, about one out of four is uncrossable by farm equipment. Accumulations of fine sand and loamy fine sand as much as 2 feet deep are in the natural drainageways at the base of these slopes. They are as much as 1 foot deep along fence rows and field borders.

The surface layer is very friable, brown fine sandy loam about 3 inches thick. The subsoil extends to a depth of 70 inches or more. Between depths of 3 and 15 inches, it is friable, yellowish red sandy clay loam; to a depth of 25 inches, it is friable, reddish brown sandy clay loam; to a depth of 36 inches, it is friable, reddish yellow sandy clay loam; to a depth of 52 inches, it is friable, pink sandy clay loam that is about 4 percent calcium carbonate, by volume; and to a depth of 70 inches, the subsoil is friable, reddish yellow sandy clay loam that is about 2 percent calcium carbonate, by volume. The soil is neutral to a depth of 15 inches, mildly alkaline between depths of 15 and 36 inches, and moderately alkaline below that.

Runoff is medium. Permeability is moderate, and the available water capacity is medium. The root zone is deep, and the soil material is easily penetrated by plant roots. Water erosion is a severe hazard, and soil blowing is a moderate hazard.

Included in mapping are small areas of Acuff, Mobeetie, Springer, and Veal soils, small areas of Miles soils that have slopes of 1 to 3 percent or 5 to 8 percent, and small areas of Miles loamy fine sand. Also included are a few areas of native rangeland where the soil is not eroded. The included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat. All of this are needed to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diver-

sions and terraces. Fertilizer is needed if this soil is used for crops. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A sprinkler or drip irrigation system is suitable.

This soil has medium potential for native range plants. The low rainfall and the eroded condition of the soil are the main limitations. The main native range plants are mid and tall grasses. Forage production is medium in favorable years.

This soil has high potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The main limitations are the slope, the low soil strength, and the hazard of seepage. They can be overcome through good design and careful installation.

This soil has high potential for recreation uses. The slope is a limitation for playgrounds.

Capability subclass IVe, nonirrigated and irrigated; Sandy Loam range site.

29—Mobeetie fine sandy loam, 1 to 3 percent slopes. This is a deep, well drained, gently sloping soil on slightly convex and concave foot slopes on uplands. The areas are irregular in shape and range from 5 to 80 acres. Local shifting of the soil by wind is evident in some cultivated areas.

The surface layer is brown fine sandy loam about 12 inches thick. The subsoil, to a depth of 26 inches, is yellowish brown fine sandy loam; to a depth of 40 inches, it is light yellowish brown fine sandy loam that is about 3 percent calcium carbonate, by volume. The substratum, to a depth of 60 inches, is very pale brown fine sandy loam that has a few threads and films of calcium carbonate. The soil is very friable and moderately alkaline throughout.

Runoff is medium. Permeability is moderately rapid, and the available water capacity is medium. The root zone is deep, and the soil material is easily penetrated by plant roots. Water erosion is a slight hazard, and soil blowing is a moderate hazard.

Included in mapping are small areas of Berda, Bippus,

and to conserve moisture. Emergency tillage is necessary to control soil blowing if the crop residue cannot provide adequate protection. Contour farming is needed to help control water erosion. In some areas, diversion terraces are needed to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions. Fertilizer is needed if this soil is used for crops. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A sprinkler or drip irrigation system is suitable.

This soil has high potential for native range plants. The low rainfall is the main limitation. The main native range plants are mid and tall grasses. Forage production is high in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The hazard of seepage is the main limitation.

This soil has high potential for recreation uses. The

to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. In some areas, contour farming and terraces are needed to help control water erosion, and diversion terraces are needed in some areas to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions and terraces. Fertilizer is needed if this soil is used for crops. Under irrigation management, an irrigation system that properly applies irrigation water also is necessary. A sprinkler or drip irrigation system is suitable.

This soil has high potential for native range plants. The low rainfall is the main limitation. The main native range plants are mid and tall grasses. Forage production is high in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The hazard of seepage is the main limitation.

This soil has high potential for recreation uses. The

This soil has medium potential for most urban uses. The slope and the hazard of seepage are the main limitations.

This soil has medium potential for recreation uses. The slope is the main limitation.

Capability subclass VIe, nonirrigated; Mixedland Slopes range site.

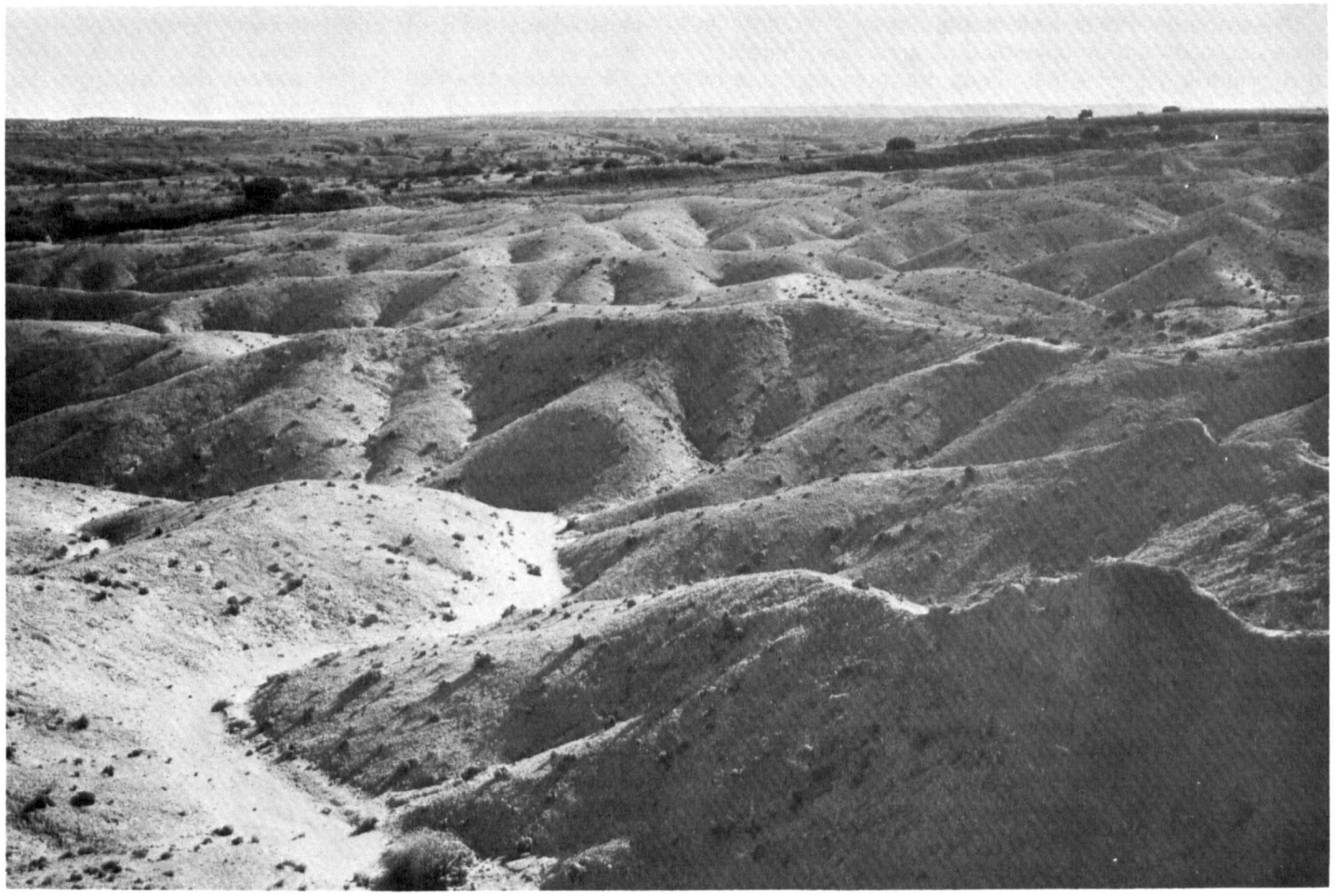
32—Mobeetie-Badland association, steep. This association consists of Mobeetie soils and areas of Badland on uplands (fig. 14). The areas are dissected by drainage channels, and geologic erosion of the soft caliche material is active. The areas range from 5 to about 100 acres. Slopes range from 20 to 45 percent. The relief ranges from 30 to 100 feet. Mobeetie soils make up about 35 percent of this association, Badland 60 percent, and minor soils 5 percent.

Mobeetie soils are well drained and are on mesalike benches between the areas of Badland. The surface layer is brown fine sandy loam about 10 inches thick. The subsoil to a depth of about 32 inches is brown fine sandy loam that is about 5 percent calcium carbonate, by volume. The substratum, to a depth of 60 inches, is light yellowish brown fine sandy loam that is about 2 percent calcium carbonate, by volume.

Runoff is very rapid. Permeability is moderately rapid, and the available water capacity is medium. The root zone is deep. Water erosion is a severe hazard, and soil blowing is a moderate hazard.

Badland consists of areas of nearly barren, steep land where runoff is very rapid and geologic erosion is active. The erosion of the soft caliche material washes large amounts of silt from these areas. The vegetation in these areas is of poor vigor.

Included in this association are small areas of Acuff, Berda, Likes, Lincoln, Miles, Polar, Potter, Spur, and Veal soils. Also included are areas where the soils have slopes of less than 20 percent or more than 45 percent. The included soils make up less than 10 percent of any one mapped area.



wildlife habitat and esthetic purposes. It is not suitable for cultivation.

This association has low potential for native range plants. The main limitations are the very rapid runoff, the high amount of sediment produced, the slope, the severe erosion hazard, and the difficulty of managing the

zone is deep. Water erosion is a severe hazard.

Included in mapping are small areas of Acuff, Berda, Likes, Lincoln, Miles, Potter, Spur, and Veal soils and a few outcrops of bedrock and redbed material. Also included are areas where the slopes are less than 10 percent or more than 30 percent. Inclusions make up

[redacted]

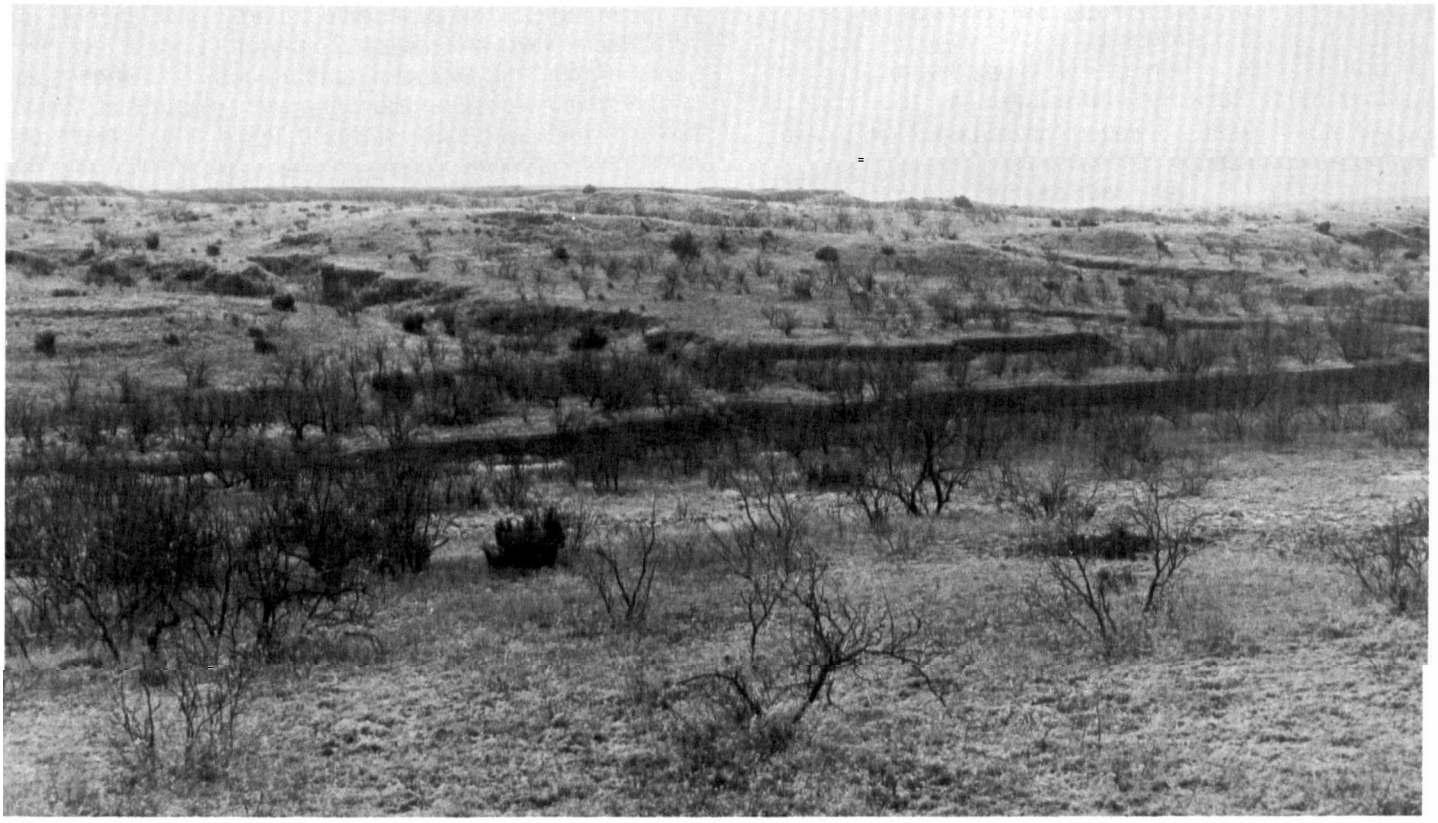


Figure 15.—An area of Obaro-Quinlan association, rolling.

The soils in this association are used mainly as range

inches, it is friable, pink clay loam that is about 35 percent calcium carbonate, by volume; and to a depth of 80 inches, the subsoil is friable, reddish yellow clay loam that is about 10 percent calcium carbonate, by volume. The soil is neutral to a depth of 25 inches and moderately alkaline below that.

Runoff is slow. Permeability is moderately slow, and the available water capacity is high. The root zone is deep, and the soil material is easily penetrated by plant roots. Water erosion and soil blowing are slight hazards.

Included in mapping are small areas of Acuff, Altus, Estacado, Pullman, and Randall soils. Also included are a few soils that have a dark grayish brown surface layer, soils that have a silty clay loam surface layer or subsoil, soils that are dark colored to a depth of more than 20 inches, soils that have significantly less clay within a depth of 60 inches, and soils that do not have a distinct layer of lime accumulation within a depth of 60 inches. Also included are small areas of Olton soils that have slopes of 1 to 3 percent. The included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat.

This soil has high potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. The main limitations are the low rainfall and the hazard of soil blowing. Crop residue should be left on the surface or worked into the surface layer to help control soil blowing and to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Contour farming and terraces are needed in some areas to help control water erosion. In places, diversion terraces are needed to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions and terraces. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A sprinkler or surface irrigation system is suitable. If a surface system is used, land leveling will be necessary in some areas. Fertilizer will be needed if this soil is irrigated.

This soil has low potential for native range plants. The low rainfall and the moderately slow rate of water infiltration are the main limitations. The main native range plants are short and mid grasses. Forage production is low in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has low potential for most urban uses. The main limitations are the shrinking and swelling of the soil, the low soil strength, and the moderate corrosivity to uncoated steel. They are difficult to overcome.

This soil has medium potential for recreation uses. The clay loam texture of the surface layer and the moderately slow permeability are the main limitations.

Capability subclass IIIe, nonirrigated, and IIe, irrigated; Clay Loam range site.

38—Olton clay loam, 1 to 3 percent slopes. This is a deep, well drained, gently sloping soil on slightly convex uplands. The areas are irregular in shape and range from 5 to 100 acres. In most cultivated fields, soil blowing and water erosion have removed a few inches of the surface layer. Heavy rains can cause a few shallow rills to form, especially on slopes of 2 to 3 percent.

The surface layer is friable, brown clay loam about 7 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 7 and 18 inches, it is firm, brown clay loam; to a depth of 30 inches, it is firm, reddish brown clay loam; to a depth of 55 inches, it is firm, yellowish red clay loam; to a depth of 66 inches, it is firm, light reddish brown clay loam that is about 35 percent calcium carbonate, by volume; to a depth of 78 inches, it is friable, reddish yellow clay loam that is about 10 percent calcium carbonate, by volume; and to a depth of 80 inches, the subsoil is friable, reddish yellow clay loam that is about 40 percent calcium carbonate, by volume. The soil is neutral to a depth of about 18 inches and moderately alkaline below that.

Runoff is slow. Permeability is moderately slow, and the available water capacity is high. The root zone is deep, and the soil material is easily penetrated by plant roots. Water erosion is a moderate hazard, and soil blowing is a slight hazard.

Included in mapping are small areas of Acuff, Bippus, Estacado, Miles, Pullman, Randall, Spur, and Veal soils. Also included are a few soils that have a light-colored surface layer, soils that do not have a distinct layer of lime accumulation within a depth of 60 inches, and soils that have significantly less clay at or below a depth of 60 inches. Also included are small areas of Olton soils that have slopes of 3 to 5 percent or 0 to 1 percent. The included soils make up less than 15 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat.

This soil has medium potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. The main limitations are the low rainfall, the slope, and the hazard of water erosion. Crop residue should be left on the surface or worked into the surface layer to help control water erosion and soil blowing and to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Contour farming and terraces are needed to help control water erosion. In places, diversion terraces are needed to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions and terraces. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A sprinkler or surface irrigation system is suitable. If a surface system is used, bench leveling will be necessary. Fertilizer will need to be applied if this soil is irrigated.

This soil has low potential for native range plants. The low rainfall and the moderately slow rate of water infiltra-

tion are the main limitations. The main native range plants are short grasses. Forage production is low in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has low potential for most urban uses. The main limitations are the shrinking and swelling of the soil, the low soil strength, and the moderate corrosivity to uncoated steel. They are difficult to overcome.

This soil has medium potential for recreation uses. The clay loam texture of the surface layer and the moderately slow permeability are the main limitations. The slope is a limitation for some playgrounds.

Capability subclass IIIe, nonirrigated and irrigated; Clay Loam range site.

39—Paloduro loam, 3 to 5 percent slopes. This is a deep, well drained, gently sloping soil on slightly concave foot slopes on uplands. The areas are irregular in shape and range from 5 to 100 acres. In some areas, U-shaped gullies have been formed by the downcutting of valleys and the headward extension of drainageways.

The surface layer is friable, dark grayish brown loam about 15 inches thick. The subsoil extends to a depth of 60 inches. Between depths of 15 and 22 inches, it is friable, brown clay loam; to a depth of 38 inches, it is friable, brown clay loam that is about 2 percent calcium carbonate, by volume; to a depth of 60 inches, it is firm, grayish brown clay loam that is about 5 percent calcium carbonate, by volume. The soil is moderately alkaline throughout.

[redacted]

an irrigation system that properly applies irrigation water is necessary. A sprinkler, surface, or drip irrigation system is suitable. If a surface system is used, bench leveling will be necessary.

This soil has medium potential for native range plants. The low rainfall and the loss of water through runoff are the main limitations. The main native range plants are short and mid grasses. Forage production is medium in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The main limitations are the slope, the moderate corrosivity to uncoated steel, and the hazard of seepage. They can be overcome through good design and careful installation.

This soil has medium potential for recreation uses. The slope and the clay loam texture of the surface layer of some Paloduro soils are the main limitations. The slope is a limitation primarily for playgrounds.

Capability subclass IVe, nonirrigated and irrigated; Hardland Slopes range site.

40—Paloduro loam, 5 to 8 percent slopes. This is a deep, well drained, sloping soil on slightly concave foot slopes on uplands. The areas are irregular in shape and range from 5 to 100 acres. In some areas, U-shaped gullies have been formed by the downcutting of valleys and the headward extension of drainageways.

The surface layer is dark brown loam about 12 inches thick. The subsoil extends to a depth of 60 inches. Be-

This soil has medium potential for the development of wildlife habitat.

This soil has medium potential for most urban uses. The main limitations are the slope, the moderate corrosivity to uncoated steel, and the hazard of seepage.

inches, it is very firm, dark grayish brown clay; to a depth of 44 inches, it is very firm, brown clay; to a depth of 56 inches, it is firm, reddish brown clay loam; to a depth of 68 inches, it is friable, pink clay loam that is about 35 percent calcium carbonate, by volume; and to a depth of

main limitation is the slope.

Capability subclass VIe, nonirrigated; Hardland Slopes range site.

41—Potter loam, 1 to 8 percent slopes. This is a very shallow to shallow, well drained, gently sloping to sloping soil on convex upland ridges. The areas are elongated and range from 5 to 100 acres.

that is about 20 percent calcium carbonate, by volume. The soil is mildly alkaline to a depth of 26 inches and moderately alkaline below that.

Runoff is slow. Permeability is very slow, and the available water capacity is medium. The root zone is deep, but it is difficult for plant roots to penetrate the clay subsoil. Water erosion and soil blowing are slight hazards.

43—Pullman clay loam, 1 to 3 percent slopes. This is a deep, well drained, gently sloping soil on slightly convex or concave slopes on uplands. The areas are elongated and range from 5 to 80 acres.

The surface layer is friable, dark grayish brown clay loam about 8 inches thick. The subsoil extends to a depth of 80 inches or more. Between depths of 8 and 29 inches, it is very firm, dark grayish brown clay; to a depth of 50 inches, it is very firm, brown clay; to a depth of 65 inches, it is firm, light brown clay loam that is about 30 percent calcium carbonate, by volume; and to a depth of 80 inches, it is firm, reddish yellow clay loam that is about 20 percent calcium carbonate, by volume. The soil is mildly alkaline to a depth of 29 inches and moderately alkaline below that.

Runoff is medium. Permeability is very slow, and the available water capacity is medium. The root zone is deep, but it is difficult for plant roots to penetrate the clay subsoil. Water erosion is a moderate hazard, and soil blowing is a slight hazard.

Included in mapping are small areas of Estacado, Olton, and Randall soils. Also included are small areas of Pullman soils that have slopes of 0 to 1 percent. These included soils make up less than 25 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat.

This soil has medium potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. The main limitations are the low rainfall, the slope, the surface crusting, the hazard of water erosion, the very slow permeability, and the clay subsoil. Crop residue should be left on the surface or worked into the surface layer to help control water erosion and soil blowing and to conserve moisture. If the crop residue cannot provide adequate protection, emergency tillage will be needed to control soil blowing. Contour farming and terraces are needed to help control water erosion. In places, diversion terraces are needed to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions and terraces. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A surface or sprinkler irrigation system is suitable. If a surface system is used, bench leveling will be necessary. Fertilizer needs to be applied if this soil is irrigated.

This soil has low potential for native range plants. The low rainfall and the slow rate of water infiltration are the main limitations. The main native range plants are short grasses. Forage production is low in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has low potential for most urban uses. The main limitations are the shrinking and swelling of the soil, the low soil strength, the high corrosivity to uncoated steel, and the very slow permeability. They are difficult to overcome.

This soil has medium potential for recreation uses. The very slow permeability and the clay loam texture of the surface layer are the main limitations.

Capability subclass IIIe, nonirrigated and irrigated; Clay Loam range site.

44—Randall clay. This is a deep, somewhat poorly drained, nearly level soil on the bottom of depressions and shallow playas. Slopes are 0 to 1 percent. The areas are circular to oval and range from 5 to 100 acres. The plains surrounding the areas of this soil are 2 to 50 feet higher in elevation. In areas where this soil has not been disturbed, the surface is characterized by gilgai microrelief consisting of microknolls and microdepressions. The microknolls are 6 to 20 inches higher than the bottom of the microdepressions. They are 2 to 10 feet wide and 3 to 20 feet apart. This gilgai microrelief is destroyed after the soil has been cultivated for a few years.

The surface layer is firm, dark gray clay about 15 inches thick. The underlying material, to a depth of 48 inches, is very firm, gray clay that has many slickensides; to a depth of 75 inches, it is very firm, gray clay that has a few slickensides. Throughout the profile, the soil is moderately alkaline and has many shiny faces of peds.

Runoff ponds on this soil. After a rain, the runoff from surrounding soils accumulates on this soil to a depth of a few inches to several feet and remains for a few days to several months. Permeability is very slow, and the available water capacity is high. When the soil dries, wide deep cracks form at the surface. Water infiltration is rapid when the soil is cracked but is very slow when the soil is wet and the cracks are sealed. The root zone is deep, but the clay generally impedes the movement of air, water, and roots. Water erosion is a slight hazard, and soil blowing is a moderate hazard.

Included in mapping and making up less than 5 percent of any one mapped area are small areas of gently sloping soils around the lakeshore.

This soil is used mainly as rangeland. In a few areas it is used for crops; however, this soil is not suitable for cultivation unless it is drained or protected against the runoff from surrounding soils.

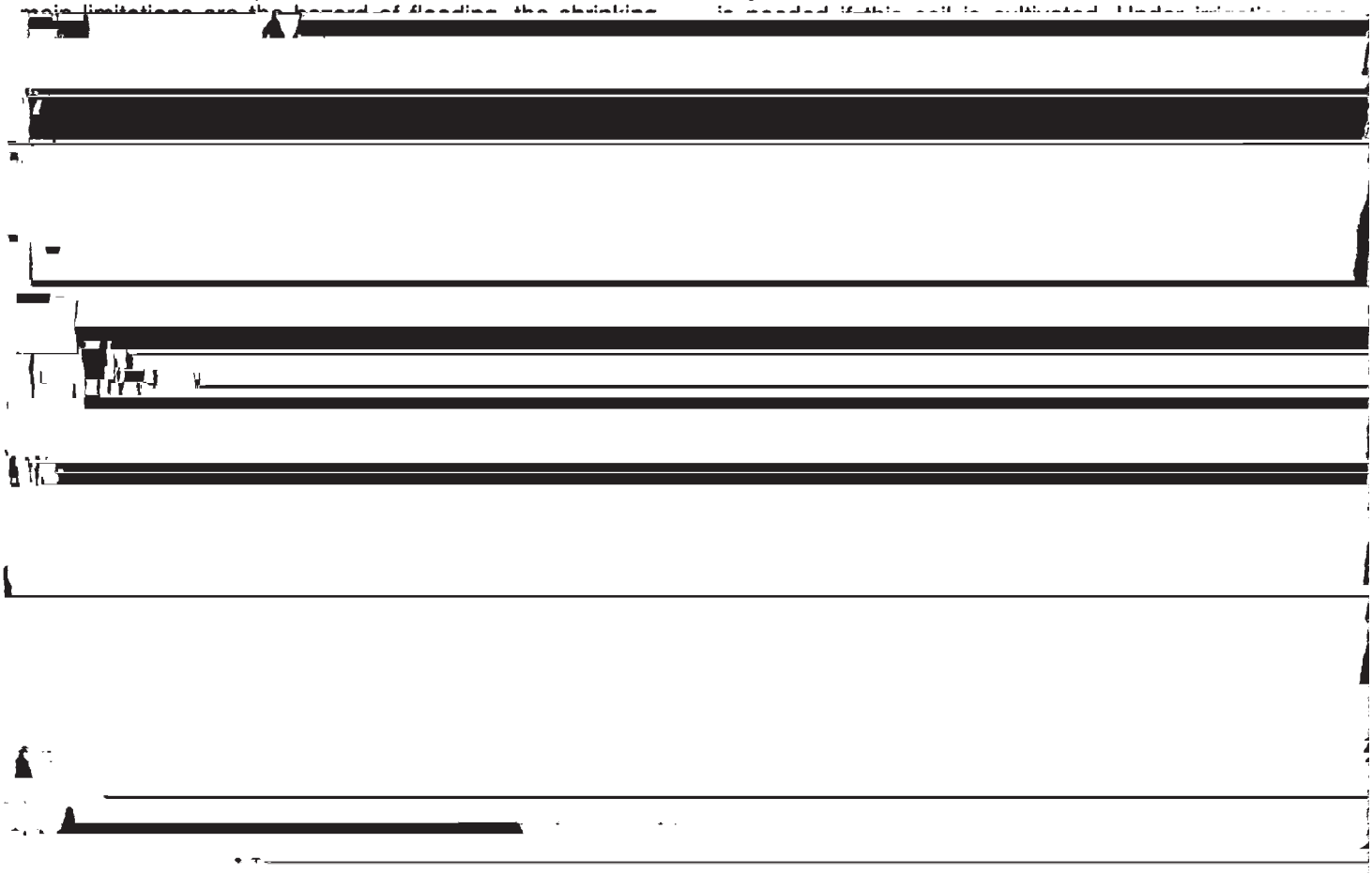
This soil has low potential for use as cropland mainly because crops are susceptible to severe damage by ponded water. If this soil is used for crops, crop residue should be left on the surface or worked into the surface layer to help prevent soil blowing and to conserve moisture. In dry years, emergency tillage will be needed to help control soil blowing if the crop residue cannot provide adequate protection.

This soil has medium potential for native range plants. It is alternately droughty and wet. Forage production is medium.

This soil has medium potential for the development of wildlife habitat. When they are ponded, the playas are used by migrating waterfowl.

This soil has low potential for most urban uses. The main limitations are the hazard of flooding, the shrinking

ways can be used as outlets for the diversions. Fertilizer is needed if this soil is cultivated. Under irrigation,



and swelling of this soil, the low soil strength, and the high corrosivity to uncoated steel.

This soil has low potential for recreation uses, mainly because of the hazard of flooding and the clay texture of the surface layer.

Capability subclass VIw, nonirrigated; Lakebed range site.

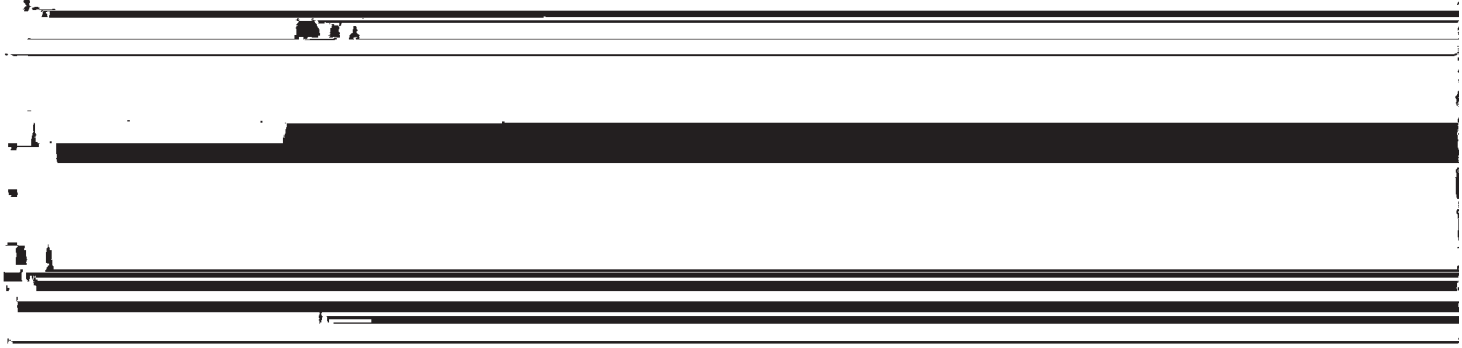
45—Springer loamy fine sand, 0 to 3 percent slopes. This is a deep, well drained, nearly level to gently sloping soil on gently undulating uplands. The

agement, an irrigation system that properly applies irrigation water is necessary. Sprinkler or drip irrigation systems are the most suitable.

This soil has high potential for native range plants. The low rainfall and the hazard of soil blowing are the main limitations. The main native range plants are mid and tall grasses. Forage production is high in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has high potential for most urban uses. The



This soil has low potential for nonirrigated and irrigated, close-spaced grain sorghum and wheat. The main limitations are the low rainfall, the slope, and the severe

On about 10 percent of the acreage, the land is characterized by blowouts. On the average, these blowouts are 75 feet wide, 150 feet long, and 6 feet deep. In most

very friable, yellowish red fine sandy loam; and to a depth of 75 inches, it is loose, reddish yellow loamy fine sand. The soil is mildly alkaline to a depth of 68 inches and moderately alkaline below that.

Runoff is medium. Permeability is moderately rapid, and the available water capacity is medium. The root zone is deep, and the soil material is easily penetrated by plant roots. Water erosion and soil blowing are moderate hazards.

Included in mapping are small areas of Acuff, Guadalupe, Likes, Lincoln, Miles, Mobeetie, Paloduro, and Veal soils. Also included are a few soils that have a lime accumulation or a dark layer below a depth of 40 inches, small areas of Springer loamy fine sand, and small areas of Springer soils that have slopes of 3 to 5 percent or 8 to 12 percent. The included soils make up less than 25 percent of any one mapped area.

This soil is used mainly as rangeland. The main crops are grain sorghum and wheat. This soil is not suitable for cotton.

This soil has low potential for nonirrigated and irrigated, close-spaced grain sorghum and wheat. The main limitations are the low rainfall, the slope, and the hazards of soil blowing and water erosion. Crop residue should be left on the surface or worked into the surface layer to help control water erosion and soil blowing and to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Contour farming and terraces are needed to help control water erosion. Diversion [illegible]

The surface layer is dark brown clay loam about 18 inches thick. The subsoil, to a depth of 36 inches, is brown clay loam that has a few threads and films of calcium carbonate. The substratum, to a depth of 45 inches, is grayish brown loam that has a few threads and films of calcium carbonate; to a depth of 60 inches, it is dark grayish brown loam. The soil is friable and moderately alkaline throughout.

Runoff is slow. Permeability is moderate, and the available water capacity is high. The root zone is deep, and the soil material is easily penetrated by plant roots. Soil blowing is a slight hazard.

Included in mapping are small areas of Bippus, Clairemont, Guadalupe, Lincoln, and Sweetwater soils. Also included are small areas of Spur soils that have a water table and mottles within a depth of 60 inches. These included soils make up less than 20 percent of any one mapped area.

This soil is used as cropland and rangeland. The main crops are cotton, grain sorghum, and wheat.

This soil has high potential for nonirrigated and irrigated cotton, grain sorghum, and wheat. The occasional flooding is the main limitation. Crop residue should be left on the surface or worked into the surface layer to help control soil blowing and to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Diversion terraces are needed in some areas to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions. Under irrigation man-

The surface layer of these soils varies in texture from place to place; it is sandy clay loam, fine sandy loam, or clay loam. Typically, it is friable clay loam that has some yellowish brown mottles and is 26 inches thick. The surface layer is dark gray in the upper 16 inches and grayish brown below that. The underlying material, to a depth of 60 inches, is very pale brown loamy fine sand that has a few yellowish brown mottles. The soil is moderately alkaline throughout.

Runoff is slow. It is ponded during periods of flooding. Permeability is moderately slow, and the available water capacity is medium. The root zone is somewhat restricted by the high water table.

Included in mapping are small areas of Clairemont, Guadalupe, Likes, Lincoln, Spur, and Tivoli soils. Also

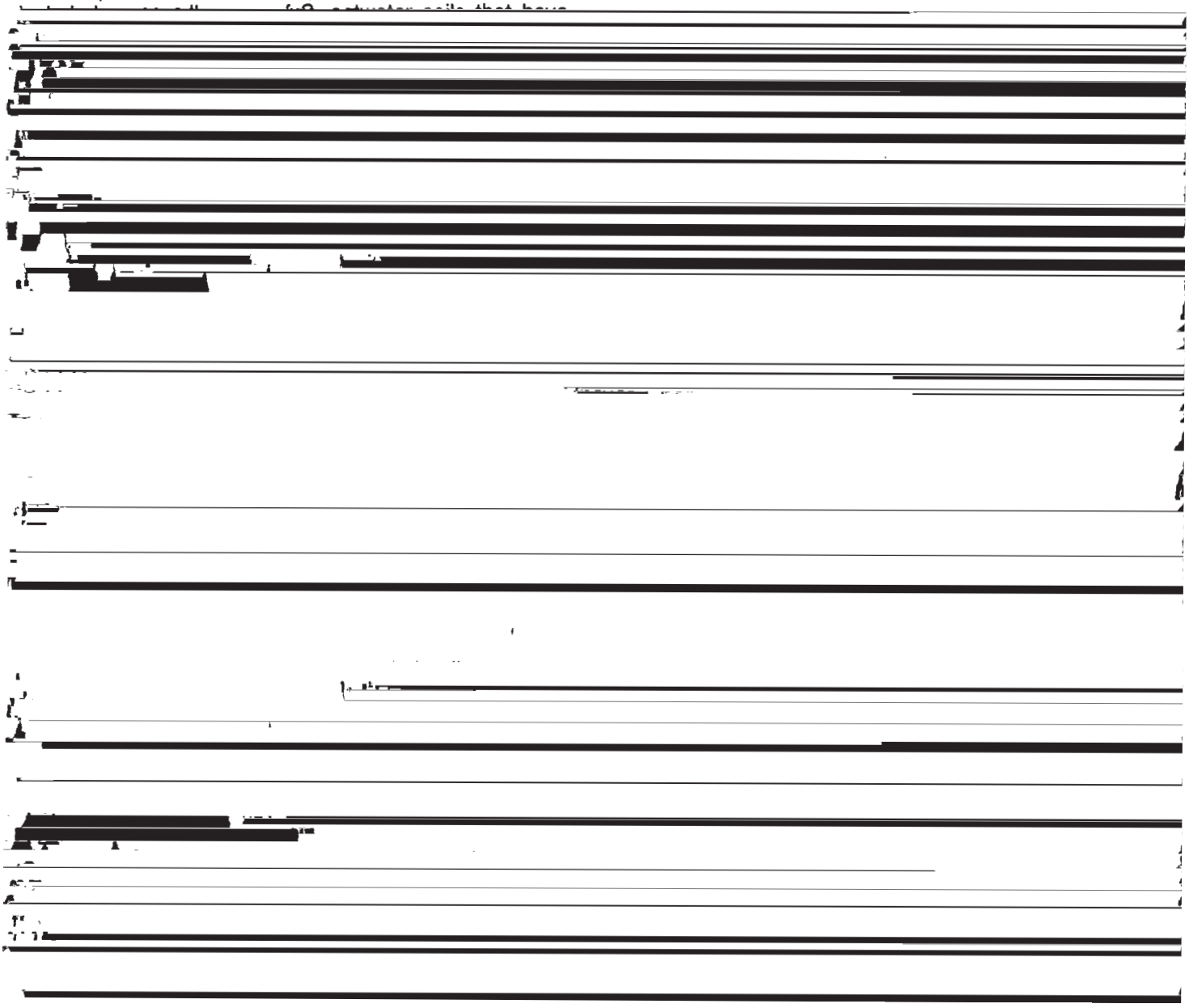
This soil has medium potential for native range plants. The low rainfall and the sandy texture of the surface layer are the main limitations. The main native range plants are mid and tall grasses. Forage production is medium in favorable years.

This soil has low potential for the development of wildlife habitat.

This soil has low potential for most urban uses. The rapid permeability and the sandy texture of the surface layer are the main limitations.

This soil has low potential for recreation uses. The slope and the sandy texture of the surface layer are the main limitations.

Capability subclass VIIe, nonirrigated; Sand Hills range site.



for crops. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A sprinkler, surface, or drip irrigation system is suitable. If a surface system is used, bench leveling will be necessary.

This soil has medium potential for native range plants. The low rainfall and the high calcium carbonate content are the main limitations. The main native range plants are short and mid grasses. Forage production is medium in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has medium potential for most urban uses. The main limitations are the low soil strength, the moderate corrosivity to uncoated steel, and the hazard of seepage. They can be overcome through good design and careful installation.

This soil has high potential for recreation uses. The slope is a limitation for some playgrounds.

Capability subclass IVe, nonirrigated, and IIIe, irrigated; Loamy range site.

53—Veal fine sandy loam, 3 to 5 percent slopes. This is a deep, well drained, gently sloping soil on slightly convex uplands. The areas are irregular in shape and range from 5 to 100 acres. In most cultivated areas, this soil is slightly eroded.

The surface layer is very friable, grayish brown fine sandy loam about 6 inches thick. The subsoil, to a depth of 12 inches, is friable, brown sandy clay loam; to a depth of 20 inches it is friable, [illegible]

to conserve moisture. Emergency tillage will be needed to control soil blowing if the crop residue cannot provide adequate protection. Contour farming and terraces are needed to help control water erosion. Diversion terraces are needed in some areas to control runoff from adjacent soils. Grassed waterways can be used as outlets for the diversions and terraces. Fertilizer needs to be applied if this soil is used for crops. Under irrigation management, an irrigation system that properly applies irrigation water is necessary. A sprinkler, drip, or surface irrigation system is suitable. If a surface system is used, bench leveling will be necessary.

This soil has medium potential for native range plants. The low rainfall and the high calcium carbonate content of this soil are the main limitations. The main native range plants are short and mid grasses. Forage production is medium in favorable years.

This soil has medium potential for the development of wildlife habitat.

This soil has medium potential for most urban uses. The main limitations are the slope, the low soil strength, the moderate corrosivity to uncoated steel, and the hazard of seepage.

This soil has high potential for recreation uses. The slope is a limitation for some playgrounds.

Capability subclass IVe, nonirrigated and irrigated; Loamy range site.

Use and management of the soils

[illegible]

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, play-

eroded and subsoil material is incorporated into the plow layer. Loss of the surface layer is especially damaging to soils that have a clay loam subsoil, such as Olton soils, and to soils that have a layer that restricts the root zone, such as Veal soils, which have a layer of caliche. Second, water erosion on farmland results in sedimentation in streams. Controlling water erosion minimizes the pollution of streams by sediment and improves the qual-

Crops

Allen H. King, conservation agronomist, Soil Conservation Service, helped prepare this section

for fish and other wildlife. Soil blowing pollutes the air and causes productive soil material to be deposited in drifts along fence rows, in bar ditches, and across roads.

Erosion-control practices provide a protective surface

Information on the design of erosion-control practices for each kind of soil in Donley County is available at the local office of the Soil Conservation Service.

Soil drainage is a management need only on the poorly drained Sweetwater soils, which make up about 1,260 acres of the survey area, and on the somewhat poorly drained Randall soils, which make up about 1,920 acres.

Soil fertility is naturally medium to low in most of the cultivated upland soils in the survey area. Fertilizer

wheat. Cotton and grain sorghum are row crops (fig. 16). Wheat is a close-grown crop.

Specialty crops grown in Donley County include some vegetables and orchard crops. Deep soils that have good natural drainage and that warm up early in spring are especially well suited to vegetables. The production of specialty crops is limited mainly by the low rainfall or by an inadequate supply of irrigation water. Some of the special field crops grown in the survey area are alfalfa,

ing is necessary before a surface irrigation system can be installed. Row irrigation is the main system used on the nearly level clayey and loamy soils (fig. 17). Irrigation runoff can be utilized by collecting it in a tailwater pit and

agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

Figure 18.—This tailwater pit collects runoff from row irrigation on Pullman clay loam, 0 to 1 percent slopes.

The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 4 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

Land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland and for engineering purposes.

In the capability system, soils are generally grouped at two levels: capability class and subclass. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that

water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to rangeland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 5. The capability classification of each map unit is given in the section "Soil maps for detailed planning."

Rangeland

John W. Wright, range conservationist, Soil Conservation Service, helped prepare this section.

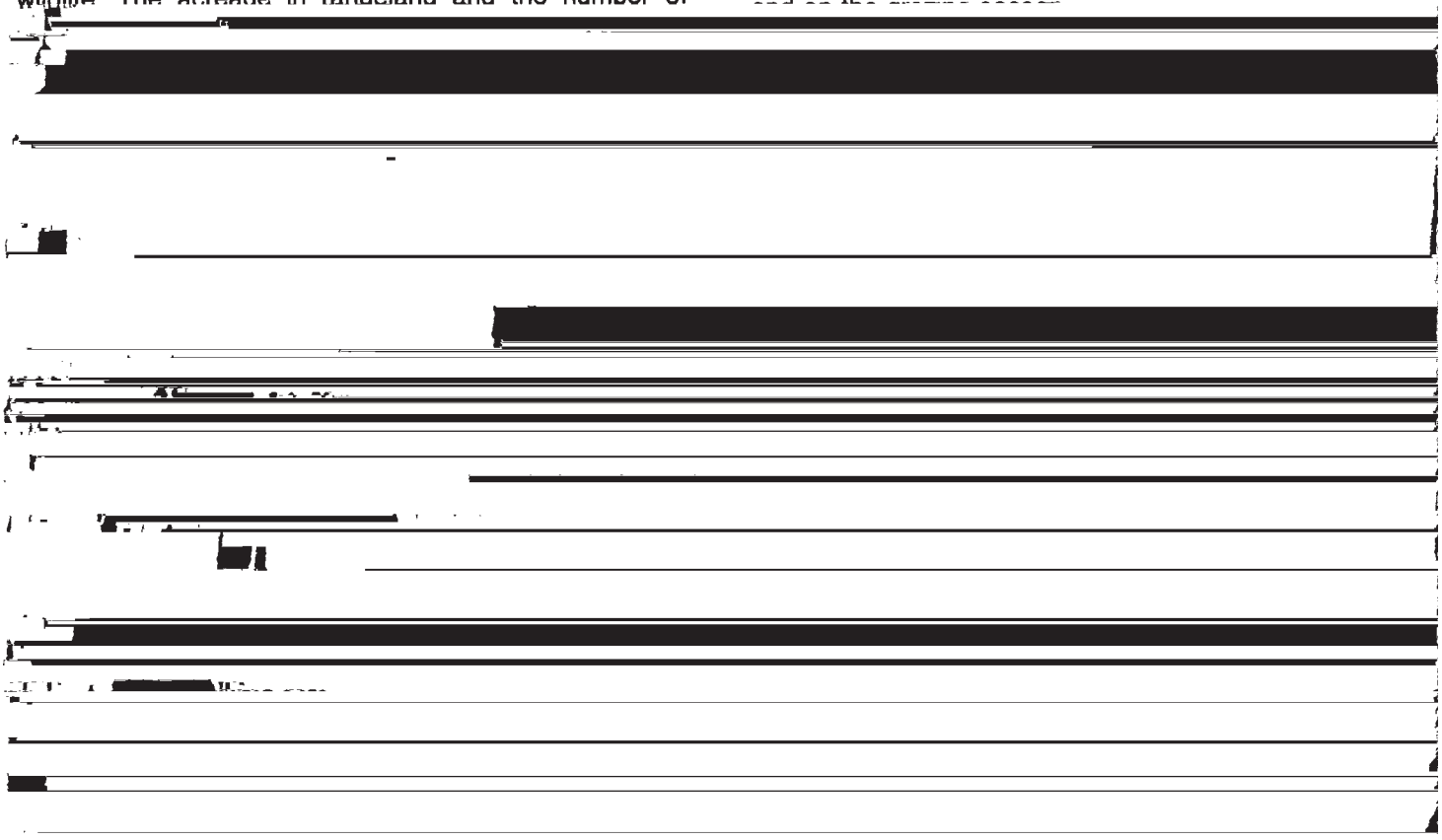
In 1967, according to the Conservation Needs Inventory (*3*), about 437,005 acres in the survey area was rangeland. Rangeland is used for the production of native vegetation for grazing by domestic livestock and wildlife. The acreage in rangeland and the number of

erties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Total production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre reduced to a common percent of air-dry moisture.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals



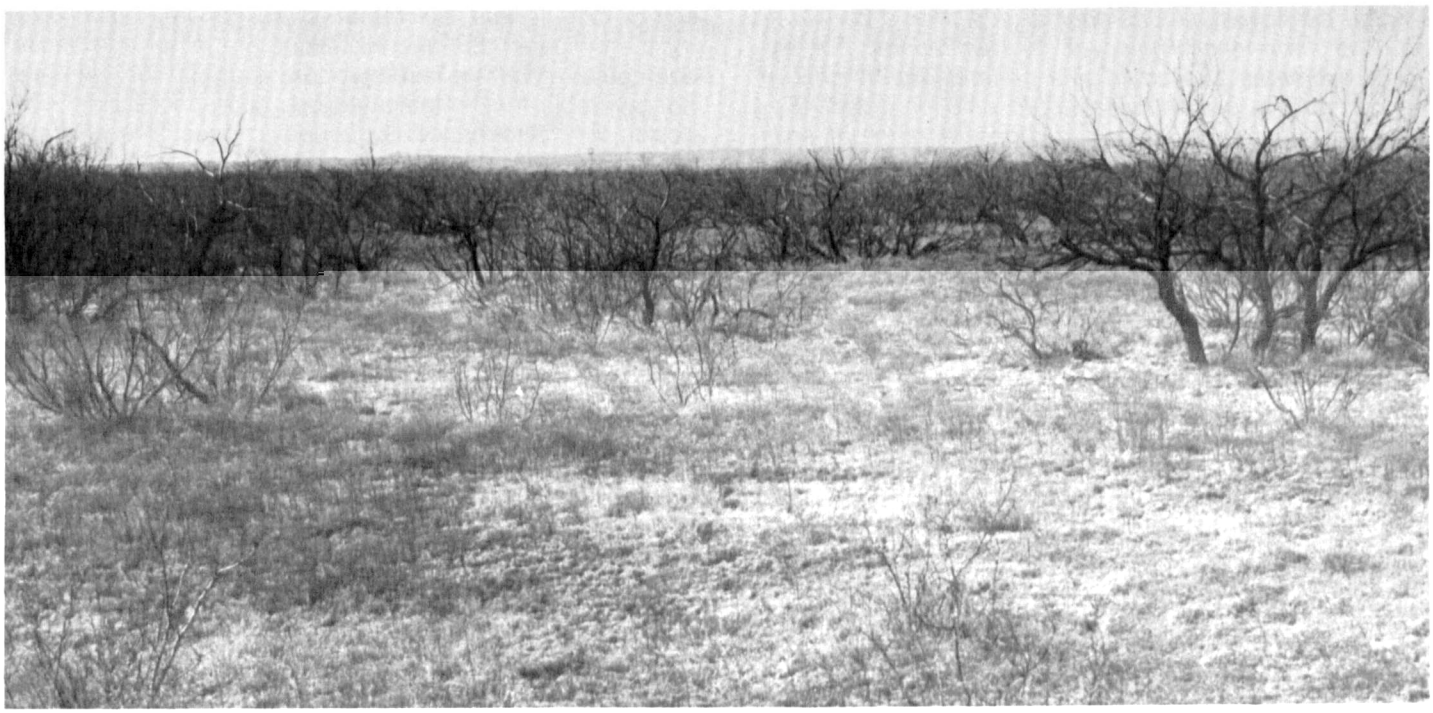


Figure 19.—Mesquite trees have invaded this area of rangeland. The soil is Olton clay loam, 0 to 1 percent slopes. This soil is in the Clay Loam range site.

has increased in these rough areas, which are suited to grazing by wildlife.

Growth of native vegetation is greatest during May and June, when rainfall and temperatures are the most favorable. Another major period of growth usually occurs during September and October. The soils on most range sites produce some cool-season grasses, but the fertile bottom-land soils produce more than most. However, cool-season grasses usually are of insignificant value for year-long forage.

Windbreaks and environmental plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, hold snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 7 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 7 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Engineering

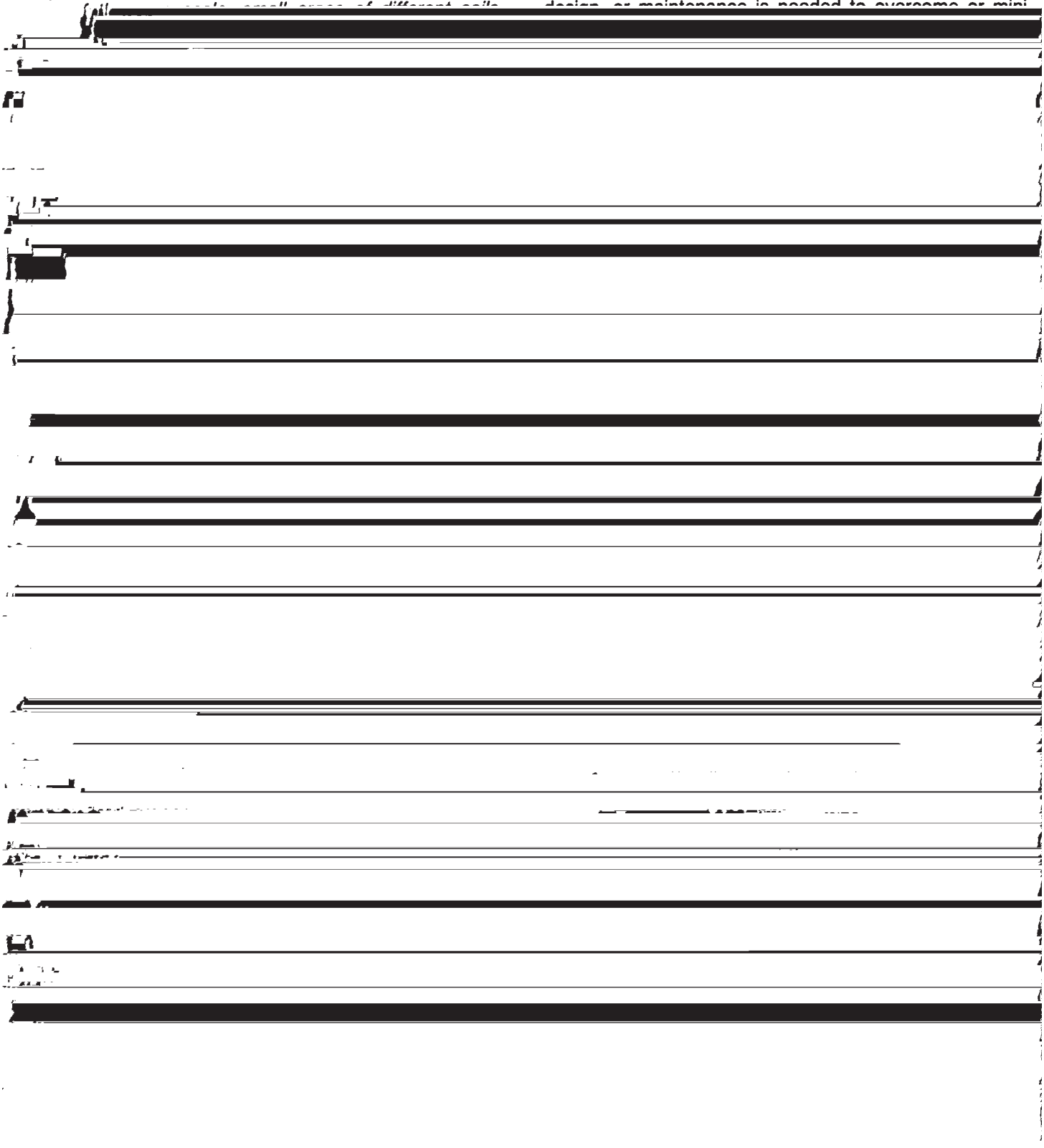
James L. Hailey, agricultural engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for

planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Be-

soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning,



ally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 9 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates

or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered

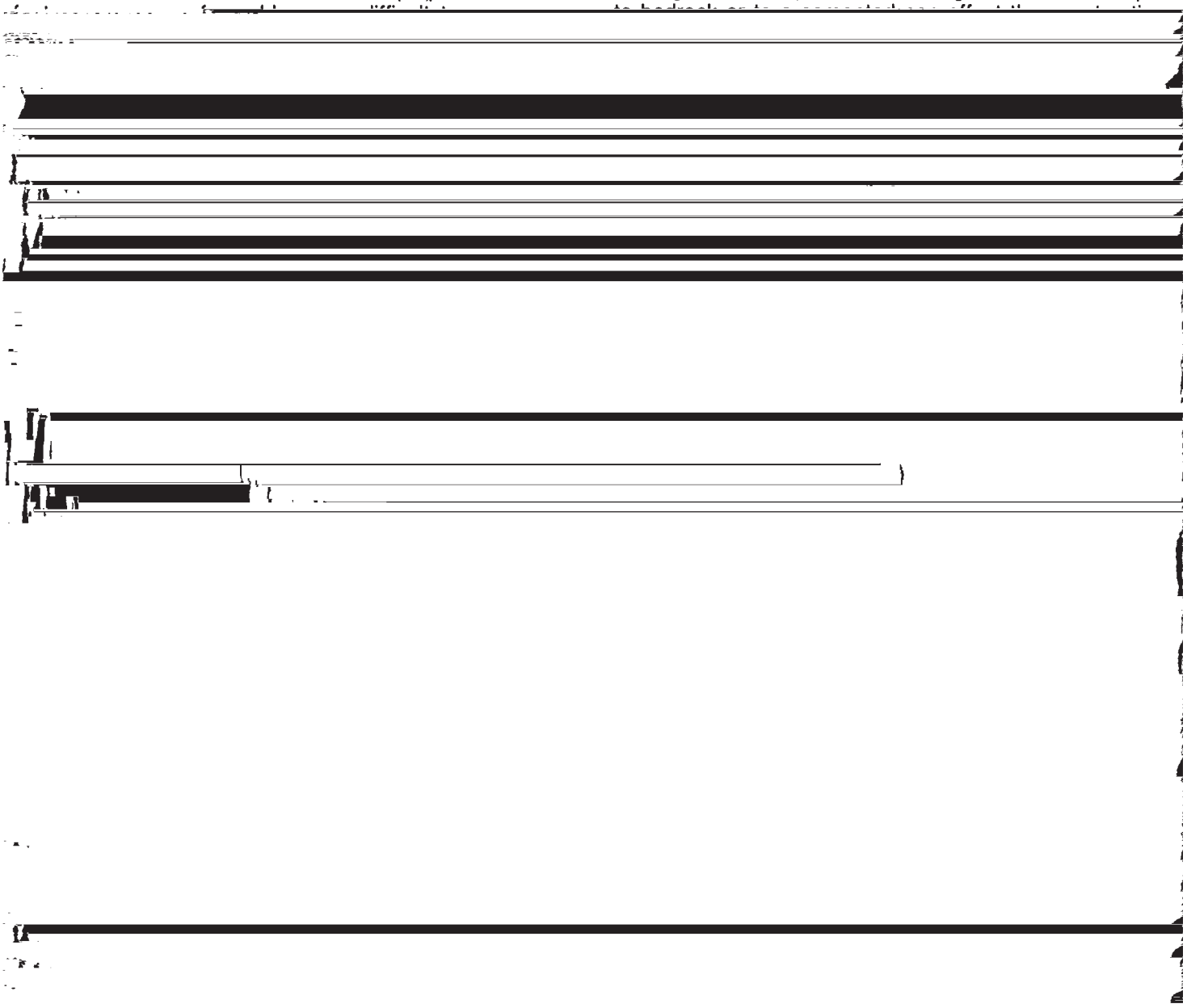
Construction materials

Table 10 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering properties and classifications.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3

not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site



that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

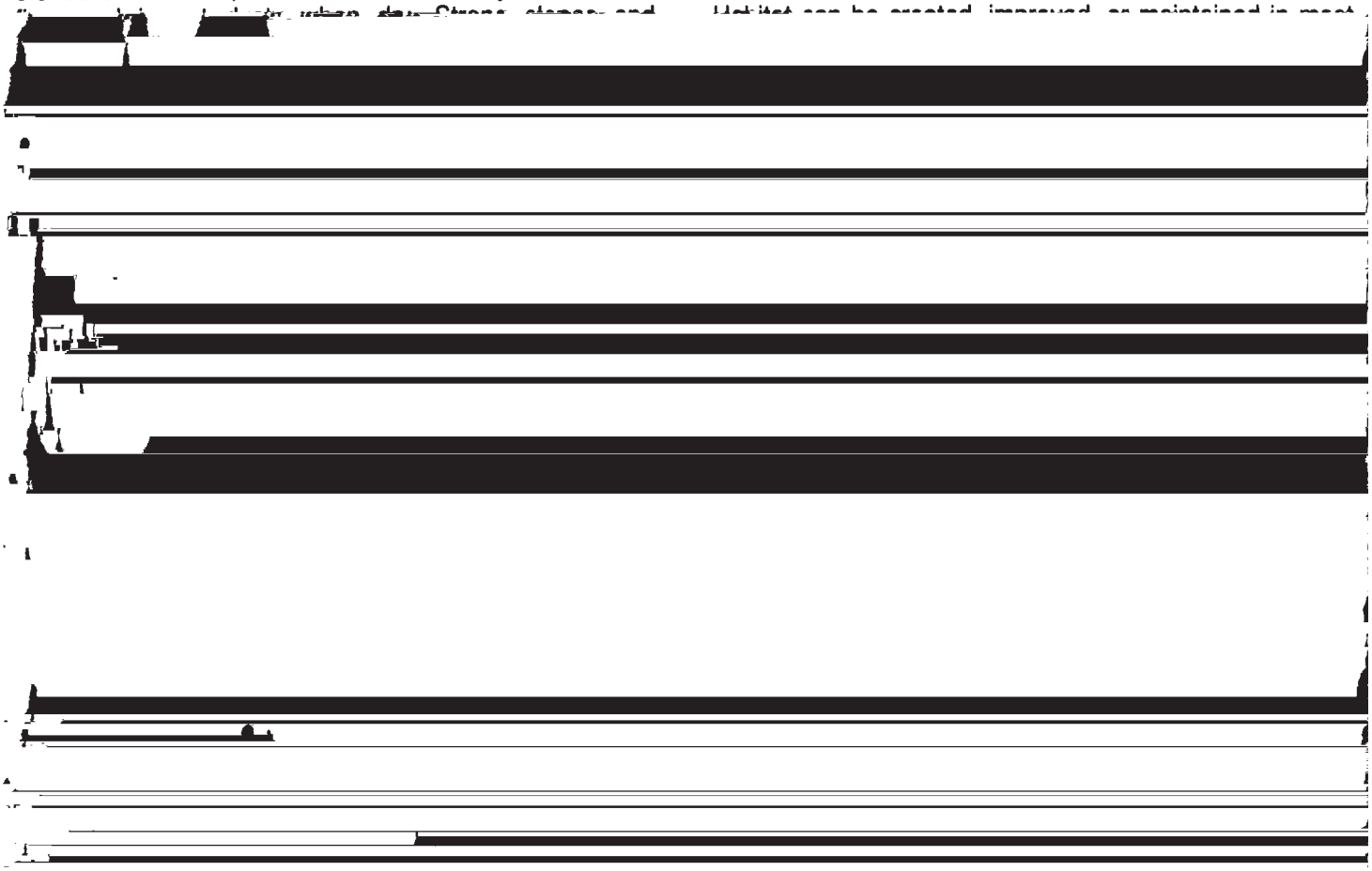
Pond reservoir areas hold water behind a dam or em-

nation of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth

of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

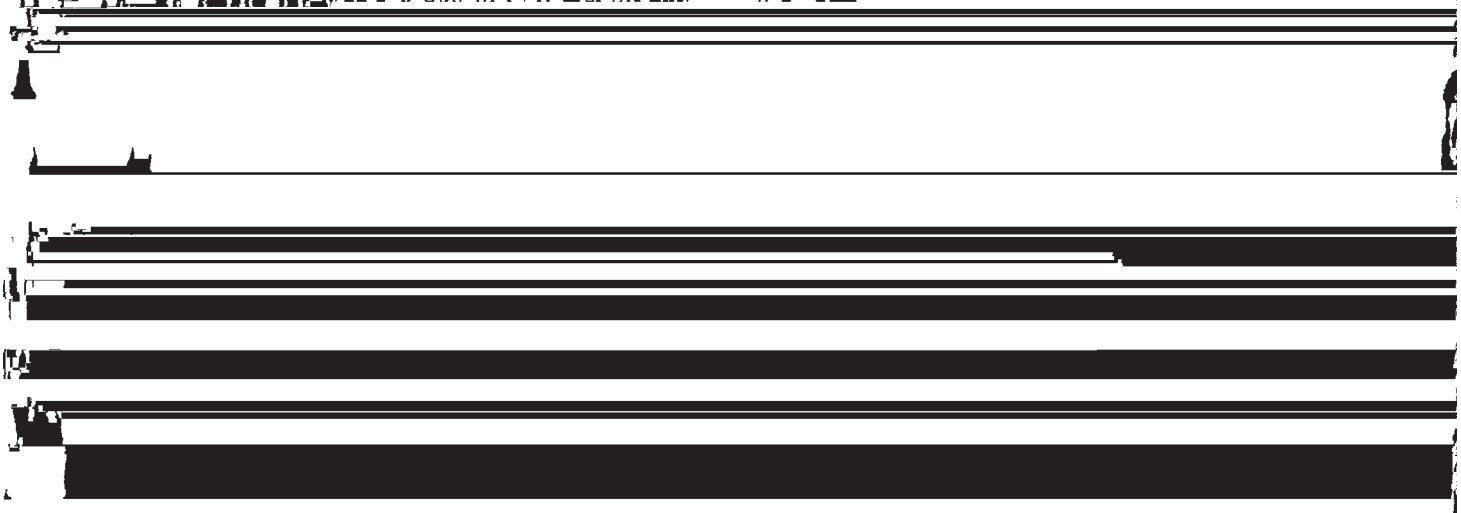
Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface

have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains



stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking



Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat.

places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improv-

areas, beaver ponds, and other wildlife ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas

Texture is given in the standard terms used by the U.S. Department of Agriculture (*4*). These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example,

Physical and chemical properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic

than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water (*5*). Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum aver-

These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Soil and water features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The

aries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

erties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Aridic Paleustolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color,

Classification of the soils

The system of soil classification used by the National

chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. An example is the Acuff series, a

ate medium subangular blocky structure; very hard, friable; patchy clay films on faces of peds; noncalcareous; moderately alkaline; gradual smooth boundary.

B22t—24 to 38 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; very hard, friable; patchy clay films on faces of peds; few very fine concretions of calcium carbonate; calcareous; moderately alkaline; gradual smooth boundary.

B23t—38 to 48 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; very hard, friable; patchy clay films on faces of peds; few films, threads, and concretions of calcium carbonate; calcareous; moderately alkaline; abrupt wavy boundary.

B24tca—48 to 64 inches; light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, friable; about 40 percent, by volume, soft masses and concretions of calcium carbonate; calcareous; moderately alkaline; gradual smooth

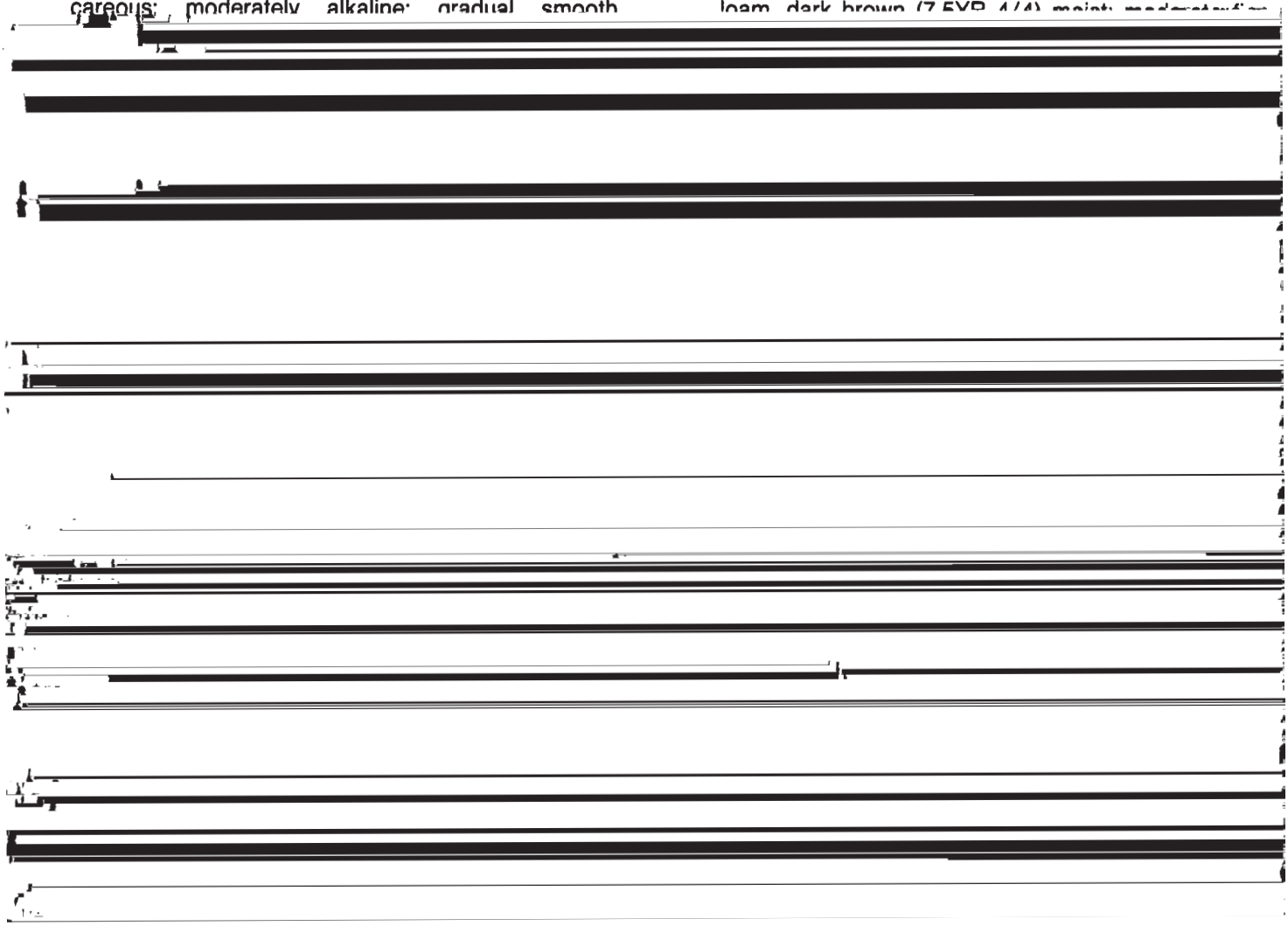
Ap—0 to 12 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable; neutral; clear smooth boundary.

B21t—12 to 24 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; very hard, friable; many very fine pores; few patchy clay films on faces of peds; mildly alkaline; clear smooth boundary.

B22t—24 to 35 inches; brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate medium subangular blocky structure; very hard, friable; few patchy clay films on faces of peds; mildly alkaline; gradual smooth boundary.

B23t—35 to 50 inches; reddish brown (5YR 5/3) sandy clay loam, reddish brown (5YR 4/3) moist; moderate fine and medium subangular blocky structure; very hard, friable; few patchy clay films on faces of peds; mildly alkaline; gradual smooth boundary.

B3—50 to 65 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist;



B21—9 to 25 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; hard, friable; common roots; many very fine pores; common worm casts; few threads and films of calcium carbonate on faces of peds; few very fine fragments of caliche; calcareous; moderately alkaline; gradual smooth boundary.

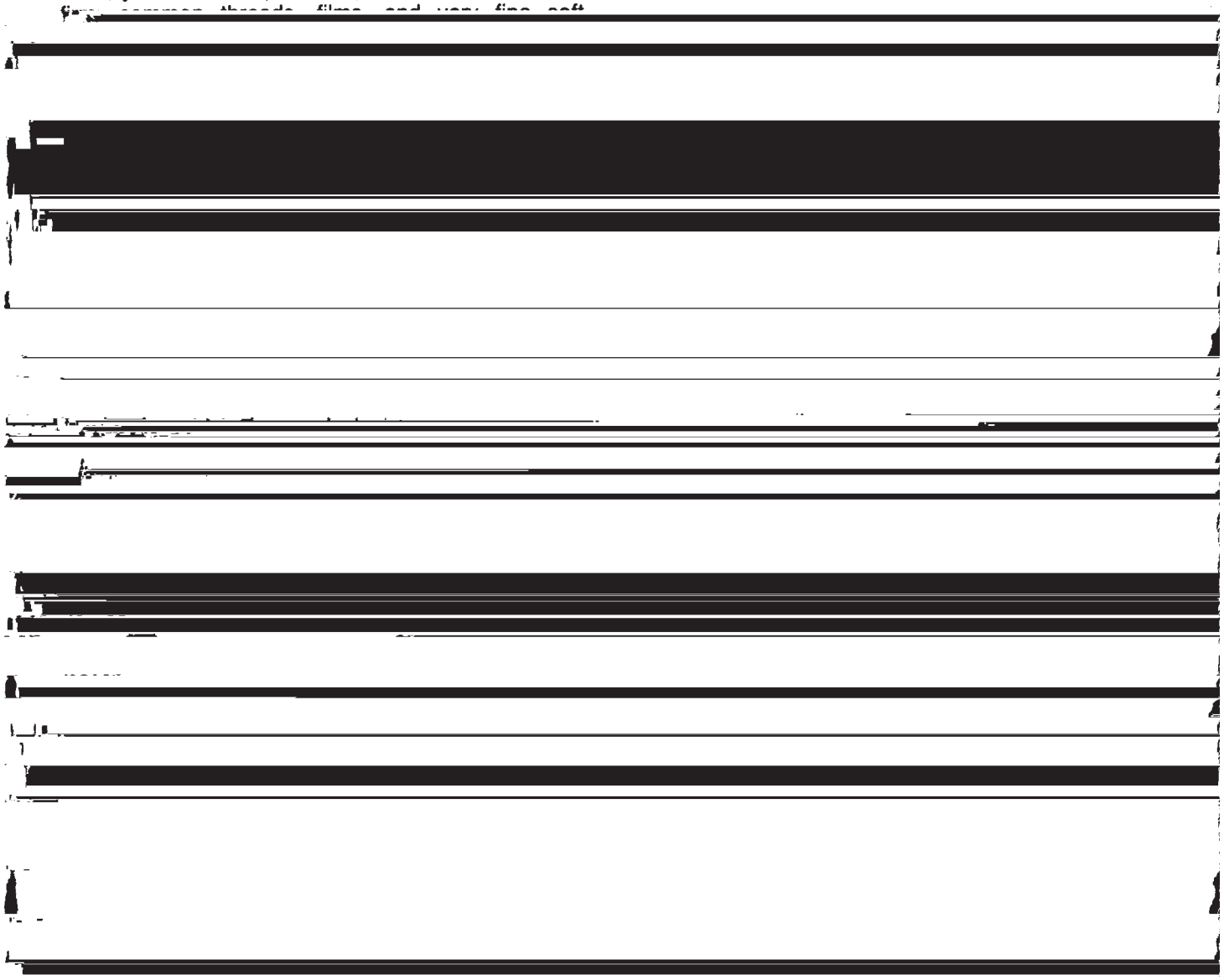
B22ca—25 to 45 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; moderate medium and fine subangular blocky structure; hard, friable; many very fine pores; few worm casts; about 8 percent, by volume, threads, films, coatings, and very fine soft masses of calcium carbonate; calcareous; moderately alkaline; diffuse smooth boundary.

C—45 to 70 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; massive; hard, [illegible] common threads, films, and very fine soft

structure parting to weak fine subangular blocky; hard, friable; common very fine pores; common threads and films of calcium carbonate; calcareous; moderately alkaline; gradual smooth boundary.

B22ca—17 to 45 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 5/4) moist; weak coarse prismatic structure parting to weak fine subangular blocky; hard, friable; few worm casts; about 10 percent threads, films, soft masses, and concretions of calcium carbonate, by volume; calcareous; moderately alkaline; clear wavy boundary.

C—45 to 60 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 5/4) moist; massive; hard, friable; about 5 percent threads, films, soft masses, and concretions of calcium carbonate, by volume; calcareous; moderately alkaline.



of peds; calcareous; moderately alkaline; gradual smooth boundary.

B21—25 to 35 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to weak fine subangular blocky; very hard, firm, slightly sticky; many fine and very fine pores; common worm casts; common threads and films of calcium carbonate on faces of peds; calcareous; moderately alkaline; gradual smooth boundary.

B22—35 to 45 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; very hard, firm, slightly sticky; many very fine pores; common worm casts; common threads and films of calcium carbonate on faces of peds; few quartz pebbles as much as 3 centimeters in diameter that have very thin coatings of calcium carbonate; calcareous; moderately alkaline; abrupt smooth boundary.

B23—45 to 58 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate fine subangular blocky structure; very hard, very firm, sticky; common very fine pores; about 4 percent, by volume, very fine soft masses, concretions, films, and threads of calcium carbonate; calcareous; moderately alkaline; abrupt smooth boundary.

B3—58 to 80 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 5/4) moist; weak fine subangular blocky structure; very hard, friable; few very fine pores; common concretions of cemented quartz and caliche pebbles that are as much as 5 centimeters in diameter; some quartz pebbles have a very thin coating of calcium carbonate; calcareous; moderately alkaline.

The solum is more than 50 inches thick. The mollic epipedon is 20 to 40 inches thick. It is dark grayish brown or dark brown.

The A horizon is 20 to 30 inches thick. It is mildly alkaline or moderately alkaline.

The B2 horizon is clay loam, sandy clay loam, or loam that is 20 to 35 percent clay in the control section. The part of the B2 horizon that is below the mollic epipedon is pale brown, brown, or light brown.

Burson series

The Burson series consists of very shallow, loamy soils on uplands. Burson soils formed in calcareous, loamy redbed sediment. Slopes range from 20 to 45 percent.

Typical pedon of Burson silt loam, in an area of Burson-Aspermont association, steep; from the intersection of U.S. Highway 287 and Farm Road 2162 in Clarendon, this pedon is located about 12 miles southwest on Farm Road 2162 and on county road to bridge over Halls Creek on the J.A. Ranch, 1.6 miles northeast on the county road, and 300 feet north in rangeland:

A1—0 to 6 inches; yellowish red (5YR 5/6) silt loam, yellowish red (5YR 4/6) moist; weak fine granular structure; slightly hard, very friable; common roots; calcareous; moderately alkaline; gradual smooth boundary.

C—6 to 60 inches; yellowish red (5YR 5/6) weakly cemented siltstone redbeds, yellowish red (5YR 4/6) moist; few roots in upper part; calcareous; moderately alkaline.

The solum is 3 to 12 inches thick. Reaction is moderately alkaline.

The A horizon is red, yellowish red, or reddish brown. It is loam, silt loam, very fine sandy loam, or silty clay loam that is 15 to 35 percent clay.

The C horizon is weakly cemented siltstone or very fine grained sandstone interbedded with strata of soft loamy or silty material. It is red, yellowish red, or reddish brown.

Carey series

The Carey series consists of deep, loamy soils on uplands. These soils formed in calcareous, loamy redbed sediment. Slopes are 0 to 3 percent.

Typical pedon of Carey loam, 1 to 3 percent slopes; from the intersection of the Gray-Donley county line and Texas Highway 273, this pedon is located 4.2 miles south on Texas Highway 273, 0.27 mile east along fence, and 100 feet north in rangeland:

A1—0 to 9 inches; dark brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; slightly hard, very friable; many very fine pores; many worm casts; neutral; clear smooth boundary.

B21t—9 to 18 inches; dark brown (7.5YR 4/2) silty clay loam, dark brown (7.5YR 3/2) moist; moderate fine and very fine subangular blocky structure; hard, friable; many very fine pores; many worm casts; few very thin clay films on faces of peds; mildly alkaline; clear smooth boundary.

B22t—18 to 26 inches; reddish brown (5YR 4/4) silty clay loam, dark reddish brown (5YR 3/4) moist; moderate medium and fine subangular blocky structure; hard, friable; many very fine pores; common worm casts; patchy clay films on faces of peds; calcareous; moderately alkaline; gradual smooth boundary.

B23t—26 to 38 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate fine and very fine subangular blocky structure; hard, friable; common very fine pores; few worm casts; few clay films on faces of peds; common films and

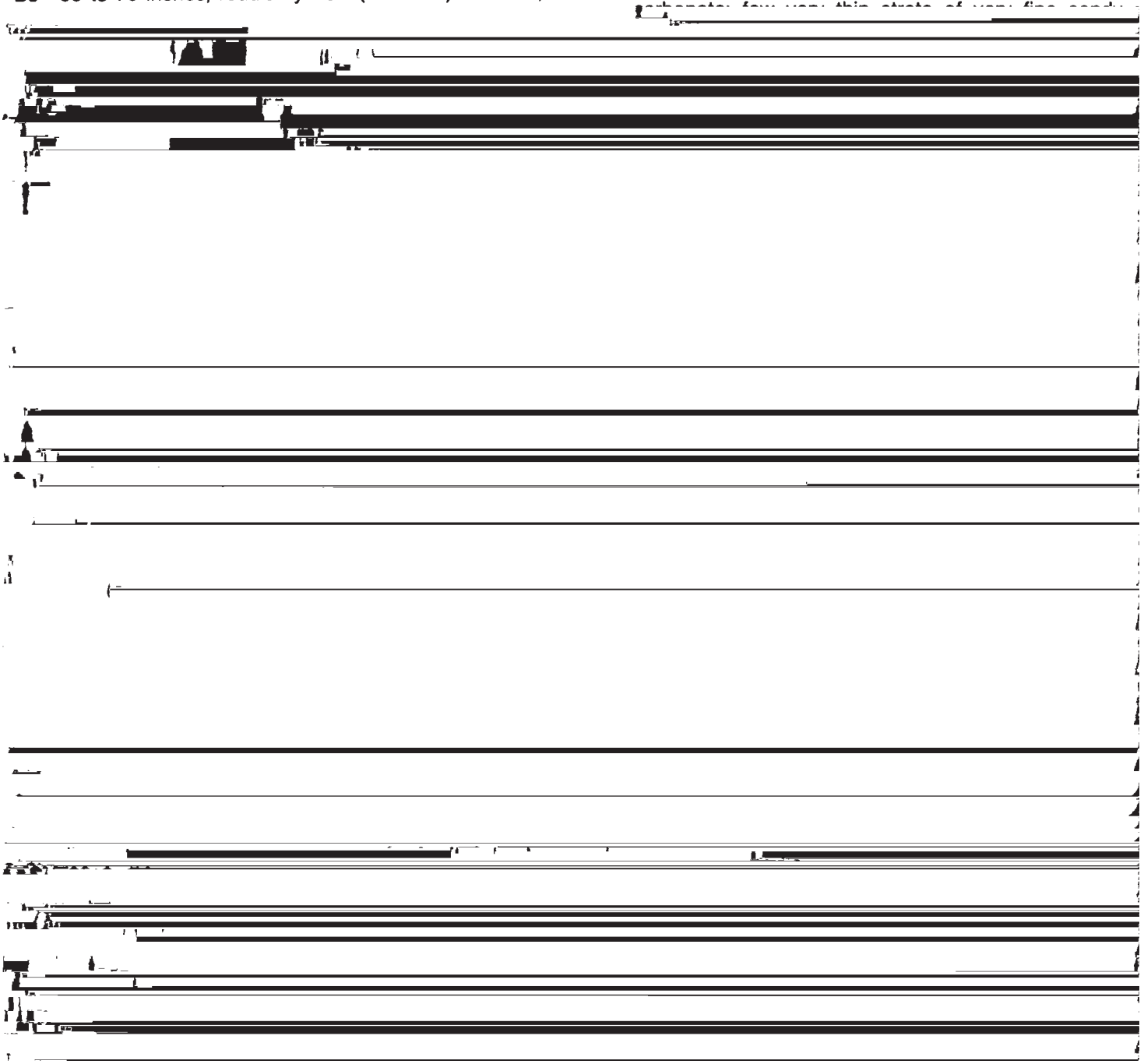
threads of calcium carbonate; calcareous; moderately alkaline; gradual smooth boundary.

B24tca—38 to 55 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; hard, friable; common very fine pores; few clay films on faces of peds; about 10 percent, by volume, medium to very fine soft masses and weakly cemented concretions of calcium carbonate; calcareous; moderately alkaline; gradual wavy boundary.

B3—55 to 70 inches; reddish yellow (5YR 6/6) silt loam, calcareous; moderately alkaline; gradual wavy boundary.

C1—9 to 40 inches; yellowish red (5YR 5/8) loam, yellowish red (5YR 4/8) moist; massive; hard, very friable; few threads and films of calcium carbonate; about 20 percent clay; thin strata of very fine sandy loam, silt loam, and silty clay loam; calcareous; moderately alkaline; clear wavy boundary.

C2—40 to 53 inches; yellowish red (5YR 5/6) loam, yellowish red (5YR 4/6) moist; massive; slightly hard, very friable; few threads and films of calcium



coated and bridged with clay; dark clay films on faces of prisms; few fine quartz pebbles; neutral; diffuse smooth boundary.

B23t—40 to 65 inches; reddish yellow (5YR 6/6) sandy clay loam, yellowish red (5YR 5/6) moist; moderate medium and fine subangular blocky structure; hard, friable; sand grains are coated and bridged with clay; neutral; gradual smooth boundary.

B3—65 to 80 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; weak fine subangular blocky structure; slightly hard, very friable; neutral.

The solum is more than 70 inches thick. The depth to secondary carbonates is more than 65 inches. In some pedons, the soil is sandy clay loam throughout, and in others it is fine sandy loam over sandy clay loam.

The A horizon is 5 to 18 inches thick. It is brown, light brown, or very pale brown.

The B21t and B22t horizons generally extend to a depth of about 40 inches. They are brown, reddish brown, or yellowish red. The clay content is 20 to 35 percent. Where the B2t horizon extends to a depth of more than 40 inches, it is red or reddish yellow.

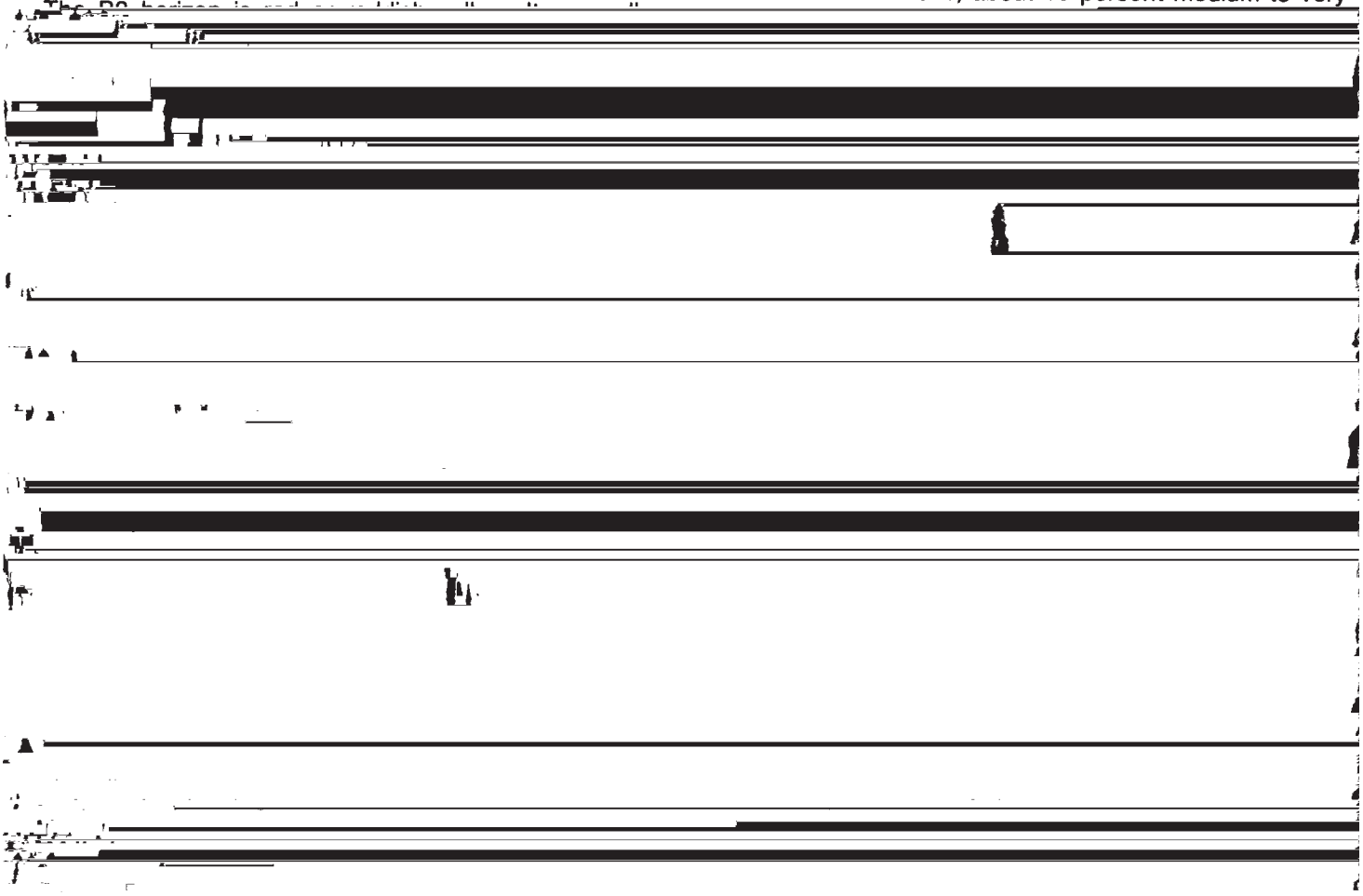
The B3 horizon is red or reddish yellow [illegible]

concretions of calcium carbonate, by volume; calcareous; moderately alkaline; gradual smooth boundary.

B22tca—24 to 54 inches; reddish yellow (7.5YR 6/6) clay loam, strong brown (7.5YR 5/6) moist; moderate coarse prismatic structure parting to weak fine subangular blocky; hard, friable; many very fine pores; few worm casts; few patchy clay films on faces of peds; about 25 percent medium to very fine soft masses and concretions of calcium carbonate, by volume; calcareous; moderately alkaline; gradual smooth boundary.

B23tca—54 to 70 inches; reddish yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; moderate medium blocky structure; hard, friable; many very fine pores; few patchy clay films on faces of peds; about 20 percent coarse to very fine soft masses and concretions of calcium carbonate, by volume; calcareous; moderately alkaline; clear smooth boundary.

B24tca—70 to 80 inches; reddish yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; weak medium blocky structure; hard, friable; few very fine pores; few patchy clay films on faces of peds; few very fine black concretions; about 10 percent medium to very



tions of calcium carbonate; calcareous; moderately alkaline; clear smooth boundary.

B22—24 to 34 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few threads and films of calcium carbonate on faces of peds; few very fine concretions of calcium carbonate; calcareous; moderately alkaline; gradual smooth boundary.

C1—34 to 50 inches; very pale brown (10YR 7/4) fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable; few very fine concretions of calcium carbonate; few thin strata of loam, silt loam, and loamy fine sand; calcareous; moderately alkaline; gradual smooth boundary.

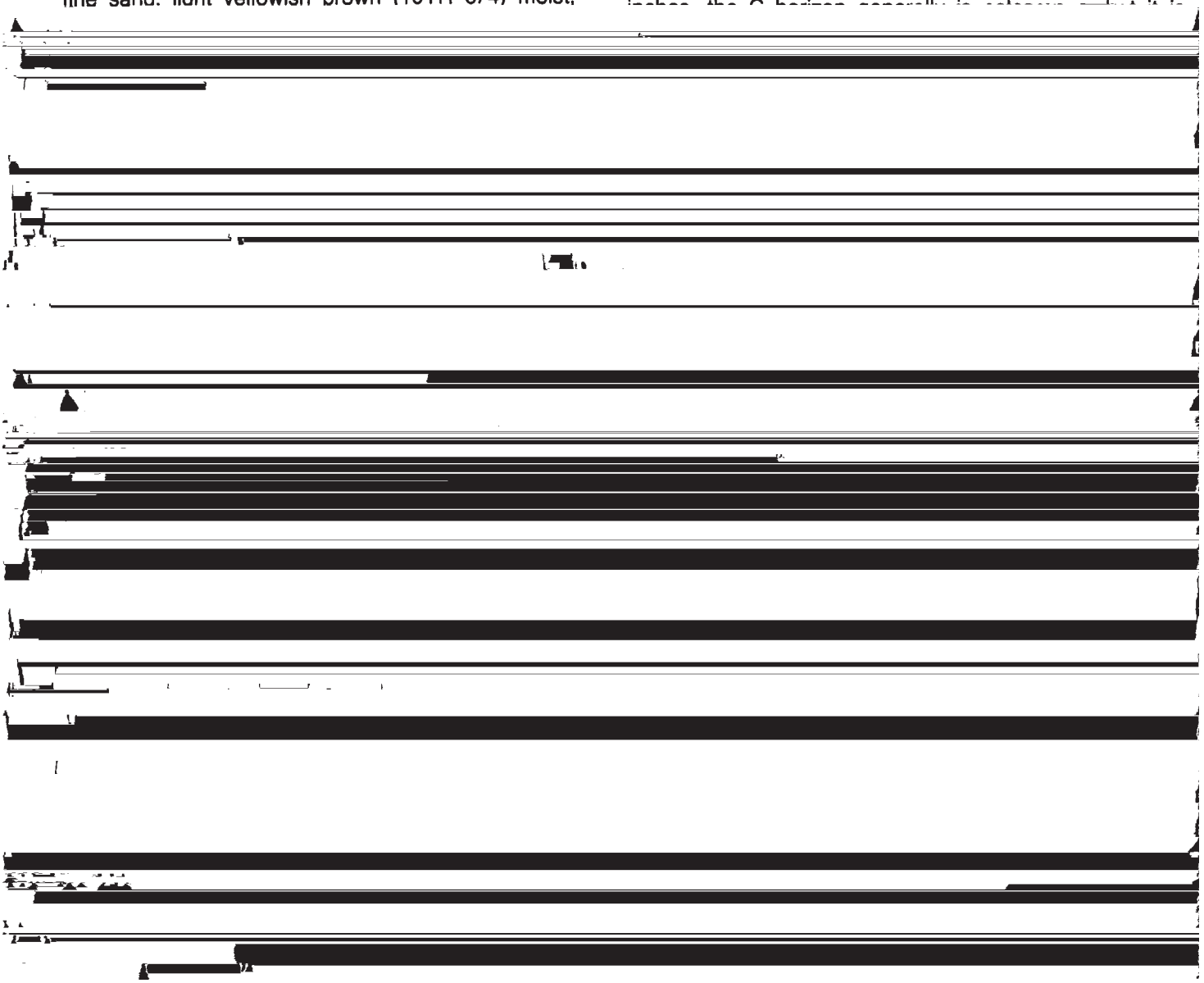
C2—50 to 65 inches; very pale brown (10YR 7/4) loamy fine sand, light yellowish brown (10YR 6/4) moist; very friable; common very fine roots; calcareous; moderately alkaline; clear smooth boundary.

C2—28 to 66 inches; pink (7.5YR 7/4) loamy fine sand, light brown (7.5YR 6/4) moist; single grained; loose, very friable; few very fine roots; few threads and films of calcium carbonate; calcareous; moderately alkaline.

The A and C horizons are more than 60 inches thick. Free carbonates are within a depth of 40 inches.

The A horizon is 5 to 14 inches thick. It is brown or grayish brown. The A horizon generally is calcareous but is noncalcareous in a few pedons.

The C horizon is brown, light brown, very pale brown, pink, yellowish brown, or light yellowish brown. It is loamy fine sand or fine sand. Within a depth of 40



The A horizon is 6 to 14 inches thick. It is brown, pale brown, or pink. It generally is calcareous but is noncalcareous in a few pedons.

The C horizon is light brown, pale brown, white, pink, very pale brown, or light yellowish brown. It is loamy fine sand or fine sand.

Miles series

The Miles series consists of deep, loamy and sandy soils on uplands. Miles soils formed in old loamy alluvial sediment that has been modified by wind and water. Slopes range from 0 to 8 percent.

Typical pedon of Miles fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 2162 and U.S. Highway 287 in Clarendon, this pedon is located 4.1 miles east on U.S. Highway 287, 5.8 miles south on Farm Road 1260, 150 feet south on county road, and 60 feet west in a pasture:

Ap—0 to 7 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak very fine granular structure; slightly hard, very friable; neutral; abrupt smooth boundary.

B1—7 to 12 inches; reddish brown (5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate very coarse prismatic structure parting to weak fine subangular blocky; very hard, friable; many fine and very fine pores; many worm casts; few patchy clay films on faces of peds; neutral; clear smooth

common very fine pores; few patchy clay films on faces of peds; about 2 percent, by volume, threads and films of calcium carbonate; calcareous; moderately alkaline.

The solum is 60 to more than 80 inches thick. The depth to secondary carbonates is 36 to more than 60 inches.

The A horizon is 7 to 20 inches thick. It is thinner in eroded areas. It is brown, light brown, or light reddish brown fine sandy loam or loamy fine sand. It is neutral or mildly alkaline.

Where present, the B1 horizon is 4 to 8 inches thick. It is brown or reddish brown loam or sandy clay loam.

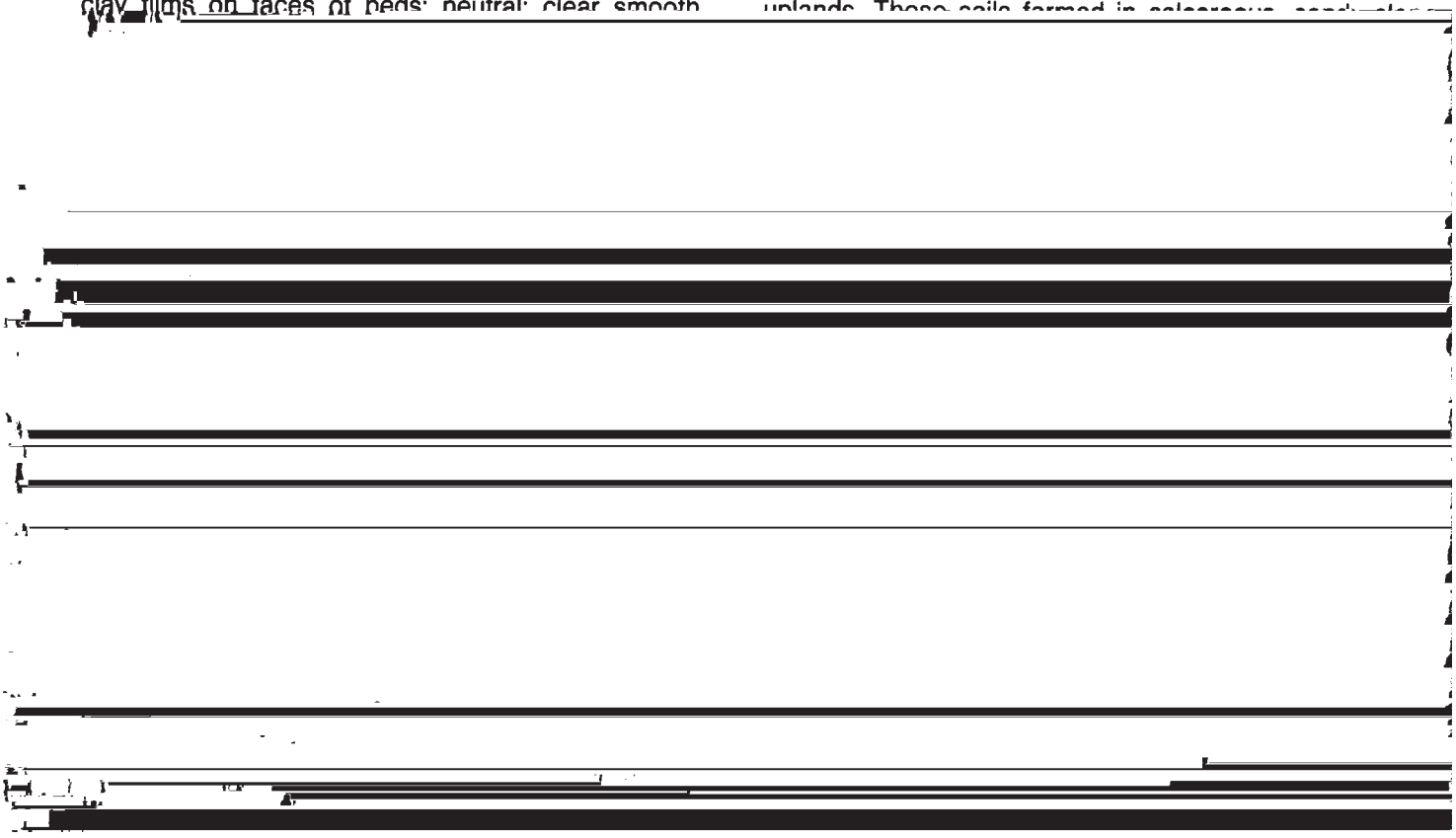
The B2t horizon is reddish brown, light reddish brown, or yellowish red. It is dominantly sandy clay loam that is 20 to 35 percent clay. In some pedons, a layer of fine sandy loam is within a depth of 60 inches and is underlain by a layer of sandy clay loam.

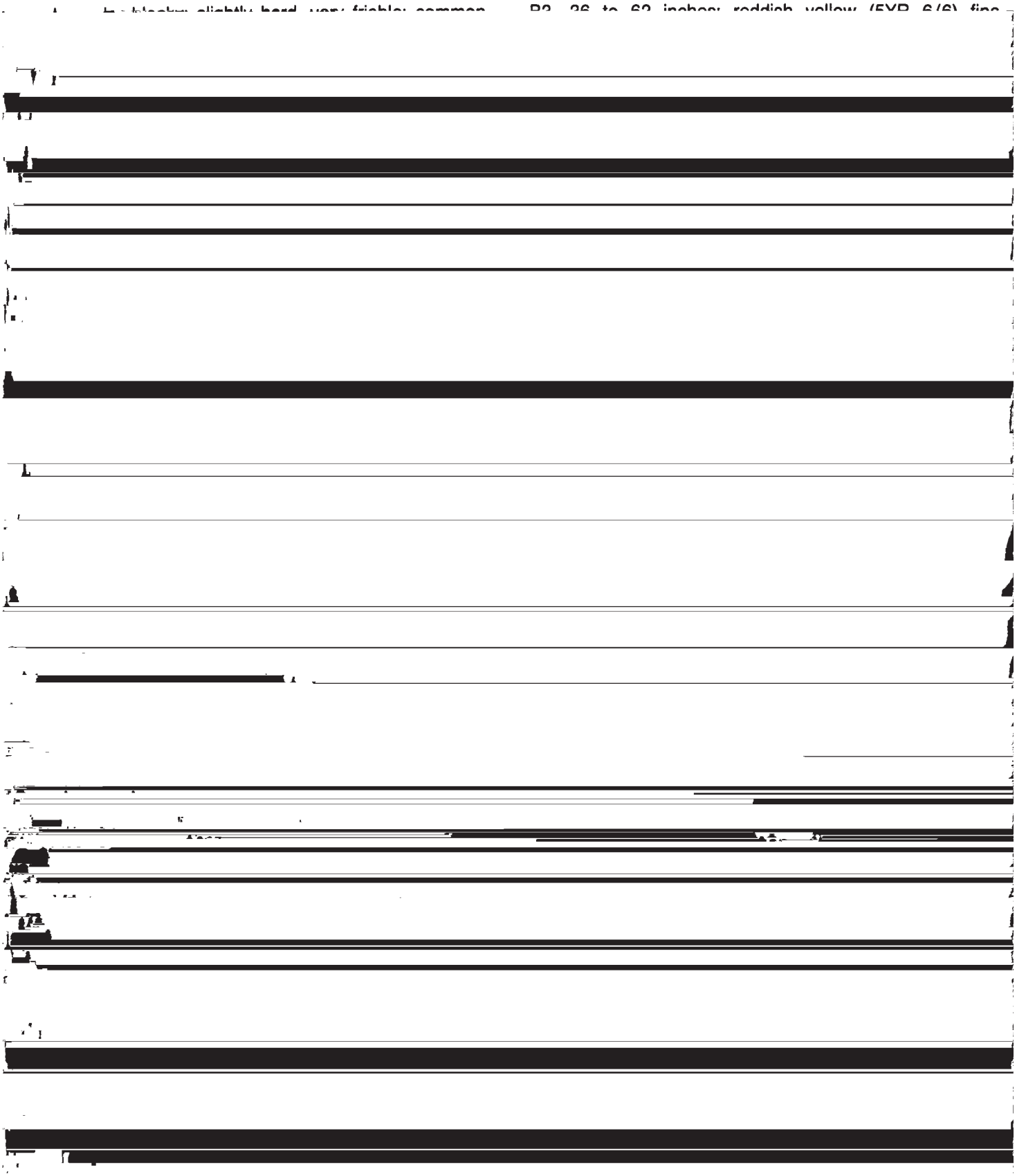
In some pedons, a B3 or B3ca horizon is below a depth of 65 inches. It is pink, reddish yellow, or very pale brown. The calcium carbonate content of calcic horizons is as high as 25 percent, by volume.

In a few pedons, a C horizon is below a depth of 65 inches. It is fine sandy loam or loamy fine sand.

Mobeetie series

The Mobeetie series consists of deep, loamy soils on uplands. These soils formed in calcareous, sandy-clay





B3ca—15 to 32 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; weak fine subangular blocky structure; hard, friable; many very fine pores; about 10 percent threads, films, soft masses, and concretions of calcium carbonate, by volume; calcareous; moderately alkaline; gradual wavy boundary.

C—32 to 60 inches; red (2.5YR 5/6) weakly cemented, calcareous siltstone, red (2.5YR 4/6) moist; few bluish green splotches.

The solum is 21 to about 48 inches thick. It is moderately alkaline throughout. The A and B horizons are loam, silt loam, or silty clay loam. The clay content ranges from 18 to 35 percent but generally is 20 to 30 percent.

The A horizon is 6 to 12 inches thick. It is reddish brown or brown.

The B horizon is light reddish brown, reddish brown, reddish yellow, or yellowish red. The content of calcium carbonate in the B3ca horizon ranges from a few threads and films to about 15 percent, by volume.

The C horizon is red, reddish brown, light red, yellowish red, or reddish yellow. It ranges from weakly cemented sandstone or siltstone to soft packsand.

Olton series

The Olton series consists of deep, loamy soils on uplands. Olton soils formed in calcareous, loamy sediment that has been modified by the wind. Slopes are 0 to 3 percent.

Typical pedon of Olton clay loam, 0 to 1 percent slopes (fig. 20); from the intersection of Interstate Highway 40 and Texas Highway 70 to Pampa, this pedon is located 0.2 mile west on south access road, 2.6 miles south and 0.25 mile southwest on county roads, and 60 feet north in a field:

Ap—0 to 6 inches; dark brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; weak very fine subangular blocky structure; hard, friable; neutral; abrupt smooth boundary.

B21t—6 to 16 inches; dark brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate fine and very fine subangular blocky structure; very hard, firm; common very fine pores; few worm casts; few very thin clay films on faces of peds; neutral; clear smooth boundary.

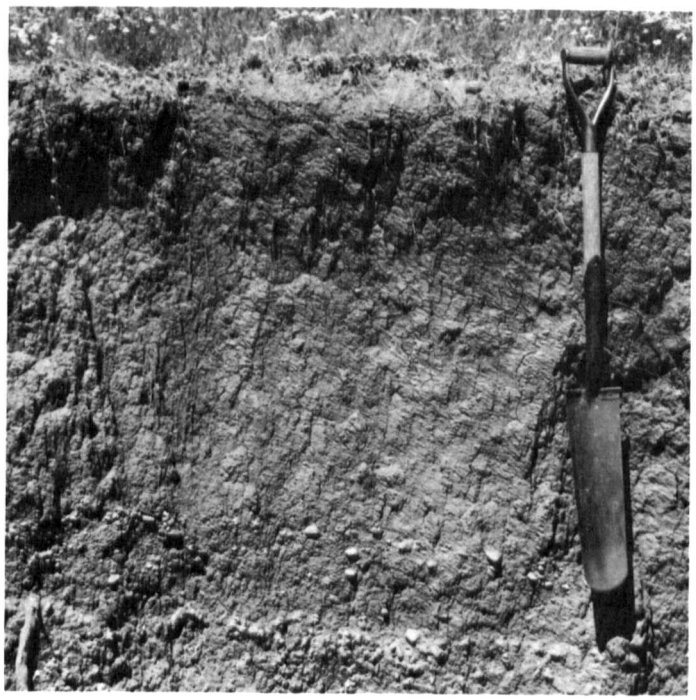


Figure 20.—Profile of Olton clay loam, 0 to 1 percent slopes.

few threads and films of calcium carbonate; calcareous; moderately alkaline; gradual wavy boundary.

B24tca—38 to 47 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; moderate very fine blocky structure; very hard, firm; patchy clay films on faces of peds; common threads and films of calcium carbonate; calcareous; moderately alkaline; clear wavy boundary.

B25tca—47 to 70 inches; pink (5YR 7/4) clay loam, light reddish brown (5YR 6/4) moist; moderate very fine blocky structure; very hard, firm; patchy clay films on faces of peds; about 35 percent medium to very fine soft masses and concretions of calcium carbonate, by volume; calcareous; moderately alkaline; clear wavy boundary.

B26tca—70 to 80 inches; reddish yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; moderate fine subangular blocky structure; very hard, friable; few patchy clay films on faces of peds; about 10 percent

The A horizon is 6 to 10 inches thick. It is brown, dark brown, or reddish brown.

The B21t horizon is 5 to 10 inches thick. It is part of the mollic epipedon and has the same colors as the A horizon.

The part of the B2t horizon that is between the mollic epipedon and the calcic layers is brown, reddish brown, or yellowish red. It is clay, clay loam, or silty clay loam that is 35 to 45 percent clay.

The lower part of the B2t horizon, including the calcic layers, is pink, yellowish red, reddish yellow, or light reddish brown. The calcium carbonate content is 5 to 40 percent, by volume.

The A horizon is 10 to 18 inches thick. It is dark brown or dark grayish brown. The A horizon generally is calcareous, but in a few pedons it is noncalcareous within a depth of 10 inches.

The B2 horizon is brown, light brown, light yellowish brown, very pale brown, or pink. The content of clay in the B2 horizon is the same or slightly more than that in the A horizon. The content of calcium carbonate in the B2 horizon ranges from a few threads and films to about 12 percent, by volume.

Polar series

[redacted]

Paloduro series

The Paloduro series consists of deep, loamy soils on uplands. Paloduro soils formed in calcareous, loamy sediment that derived mainly from local alluvium. Slopes range from 3 to 8 percent.

Typical pedon of Paloduro loam, 5 to 8 percent slopes; from the intersection of the Chicago, Rock Island, and Pacific Railroad and Texas Highway 70 at Jericho, this pedon is located 2 miles south on Texas Highway 70 and 300 feet west in rangeland:

A1—0 to 12 inches; dark brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; hard, friable; many very fine roots;

uplands. Polar soils formed in calcareous, loamy water-laid deposits of intermingled gravel and finer material. Slopes range from 10 to 30 percent.

Typical pedon of Polar very gravelly sandy loam, in an area of Mobeetie-Polar association, hilly; from the intersection of U.S. Highway 287 and Farm Road 2162 in Clarendon, this pedon is located about 13.5 miles southwest on Farm Road 2162 and on a county road to the bridge over Mulberry Creek, 850 feet north on county road, and 10 feet east in rangeland:

A1—0 to 7 inches; brown (7.5YR 5/4) very gravelly sandy loam, dark brown (7.5YR 4/4) moist; about 50 percent of the surface is covered with quartz peb-

The Cca horizon is brown, light brown, or pale brown. It is 8 to 25 inches thick. It is 15 to 35 percent, by volume, calcium carbonate.

The lower part of the C horizon is brown, light brown, pinkish gray, or pink. It is 2 to 15 percent calcium carbonate, by volume. Cross-bedded loamy sand and gravel are in some pedons.

Potter series

[redacted]

Pullman series

The Pullman series consists of deep, loamy soils on uplands. Pullman soils formed in loamy eolian material. This material was deposited in successive layers, and the period between each deposition was long enough for the soil-forming processes to operate. Slopes are 0 to 3 percent.

Typical pedon of Pullman clay loam, 0 to 1 percent slopes; from the intersection of Interstate Highway 40 and Texas Highway 70 to Pampa, this pedon is located 2

The solum is 60 to more than 75 inches thick. The depth to secondary soft lime is 15 to 30 inches. When dry, these soils have 1/4- to 1-inch wide cracks that extend to a depth of 20 inches or more.

The mollic epipedon is more than 20 inches thick. It comprises the A horizon and the upper part of the B2t horizon. It is dark brown, brown, or dark grayish brown.

The A1 or Ap horizon is 4 to 8 inches thick.

The part of the B2t horizon between the mollic epipedon and the upper calcic layer is brown or reddish brown. The B2tca horizon is brown, light brown, pink, yellowish red, or reddish yellow clay loam, silty clay loam, or clay. It is 20 to 40 percent calcium carbonate, by volume.

Quinlan series

The Quinlan series consists of shallow, loamy soils on uplands. Quinlan soils formed in loamy, calcareous redbeds of weathered sandstone or siltstone. Slopes range from 5 to 16 percent.

Typical pedon of Quinlan loam, in an area of Obaro-Quinlan association, rolling; from the intersection of Farm Road 2162 and U.S. Highway 287 in Clarendon, this pedon is located 4.1 miles east on U.S. Highway 287, about 10.2 miles north and east on Farm Road 1260, 0.85 mile east on dirt road, and 200 feet north in rangeland:

A1—0 to 7 inches; yellowish red (5YR 5/6) loam, yellowish red (5YR 4/6) moist; moderate medium granular structure; slightly hard, very friable; common very

Randall series

The Randall series consists of deep, clayey soils on the bottom of playas or intermittent lakes. Randall soils formed in clayey local alluvium. Slopes are 0 to 1 percent.

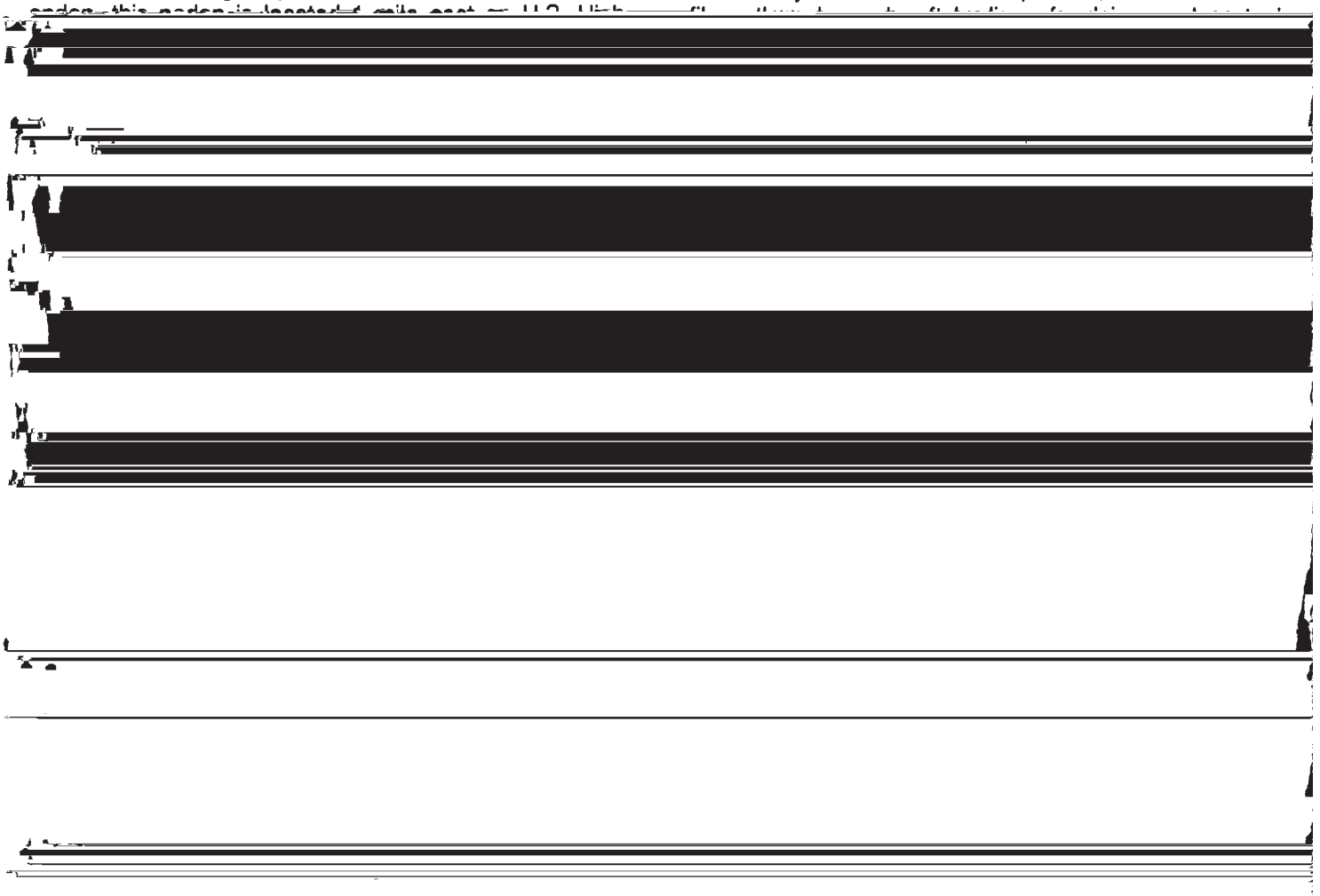
Typical pedon of Randall clay; from the intersection of the Chicago, Rock Island, and Pacific Railroad and Texas Highway 70 at Jericho, this pedon is located 0.25 mile south on Texas Highway 70 and 80 feet east on a playa:

A1—0 to 15 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; weak coarse blocky structure parting to moderate fine blocky; very hard, firm, very sticky and plastic; many shiny faces on peds; common fine concretions of calcium carbonate; calcareous; moderately alkaline; gradual wavy boundary.

AC1—15 to 48 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; moderate to strong fine and medium angular blocky structure; wedge-shaped peds 1 to 3 inches in length with the long axis tilted 10 to 30 degrees from horizontal; extremely hard, very firm, very sticky and plastic; many shiny faces on peds; many intersecting slickensides, a few as much as 2 feet long; few fine concretions of calcium carbonate; calcareous; moderately alkaline; gradual smooth boundary.

AC2—48 to 75 inches; gray (10YR 6/1) clay, gray (10YR 5/1) moist; few medium distinct light brown (7.5YR 6/4) mottles; weak medium blocky structure; extremely hard, very firm, very sticky and plastic; many shiny faces on peds; few short intersecting slicken-

Typical pedon of Springer loamy fine sand, 3 to 8 percent slopes; from the intersection of U.S. Highway 287 and Texas Highway 70 on the eastern side of Clar-



way 287, 1.8 miles north on county road, and 20 feet west on rangeland:

A11—0 to 8 inches; brown (7.5YR 5/4) loamy fine sand, dark brown (7.5YR 4/4) moist; weak very fine granular structure; loose; common very fine roots; neutral; clear smooth boundary.

A12—8 to 16 inches; reddish brown (5YR 5/4) loamy fine sand, reddish brown (5YR 4/4) moist; weak very fine granular structure; loose; common very fine roots; neutral; clear smooth boundary.

B2t—16 to 28 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure parting to weak fine subangular blocky; slightly hard, very friable; common very fine

some pedons, there are pockets of clean sand grains and thin bands of sandy clay loam. The soil is neutral to moderately alkaline. In some pedons, there are a few

these horizons.

Spur series

The Spur series consists of deep, loamy soils on bottom lands. Spur soils formed in calcareous, loamy alluvial sediment. Slopes are 0 to 1 percent.

Typical pedon of Spur clay loam, occasionally flooded; from the intersection of U.S. Highway 287 and Texas Highway 203 in Hedley, this pedon is located about 4.7 miles southeast on U.S. Highway 287 and 100 feet northeast on rangeland:

A11—0 to 10 inches; dark brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; weak fine and

Sweetwater series

The Sweetwater series consists of deep, loamy soils on bottom lands. Sweetwater soils formed in loamy alluvial sediment. They have a high water table. Slopes are 0 to 3 percent.

Typical pedon of Sweetwater clay loam, in an area of Sweetwater soils; from the intersection of Farm Road 2162 and U.S. Highway 287 in Clarendon, this pedon is located 2 miles east on U.S. Highway 287, 3.4 miles north and 0.25 mile east on county road, 1.05 miles [illegible]

A11—0 to 16 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; few fine distinct yellowish brown mottles; moderate fine granular structure; very hard, friable; common fine and very fine roots; calcareous; moderately alkaline; clear smooth boundary.

A1—0 to 6 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; weak fine granular structure; loose, very friable; common fine and very fine roots; neutral; clear wavy boundary.

C—6 to 60 inches; reddish yellow (7.5YR 7/6) fine sand, reddish yellow (7.5YR 6/6) moist; single grained; loose; few roots; mildly alkaline.

The A horizon is 6 to 10 inches thick. It is brown, pale brown, or grayish brown. The soil is slightly acid to mildly alkaline and is noncalcareous.

The C horizon is pale brown, very pale brown, light brown, light yellowish brown, reddish yellow, or pink. It is fine sand or sand. The soil is neutral to moderately alkaline. In some pedons, the soil is calcareous below a depth of 40 inches.

Veal series

B3ca—35 to 45 inches; pink (5YR 7/4) sandy clay loam, light reddish brown (5YR 6/4) moist; weak fine subangular blocky structure; very hard, friable; many very fine pores; about 20 percent threads, films, and medium to very fine soft masses and concretions of calcium carbonate, by volume; calcareous; moderately alkaline; diffuse smooth boundary.

C—45 to 80 inches; pink (5YR 7/3) sandy clay loam, light reddish brown (5YR 6/3) moist; massive; very hard, friable; about 10 percent threads, films, and medium to very fine soft masses and concretions of calcium carbonate, by volume; calcareous; moderately alkaline.

The solum is more than 40 inches thick. The depth to

isms are conditioned by relief. The parent material also influences soil formation and, in extreme cases, entirely determines the kind of soil that is formed. Finally, time is needed for changing the parent material into soil and for horizon differentiation. In general, a long time is required

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other four. In the following paragraphs, the factors of soil formation are briefly discussed as they relate to the soils in Donley County.

Parent material

Parent material is the unconsolidated mass in which a

depth of more than 6 feet. Consequently, many soils have a horizon of calcium carbonate accumulation within a few feet of the surface. Most of the young soils have lime throughout the profile.

Summer temperatures are high, and winter temperatures are mild. The high temperatures and low rainfall in Donley County have limited the accumulation of organic matter in the soils.

Plants and animals

Plants, animals, insects, and bacteria are important in the formation of soils. Living organisms can cause gains in organic matter and nitrogen in the soil, gains or losses in plant nutrients, and changes in soil structure and porosity.

[redacted]

mation on these soils. Potter and Quinlan soils are examples.

References

(1) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Texas Conservation Needs Committee. 1970. Conservation needs inventory. USDA-SCS, publ. 297

[redacted]

25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

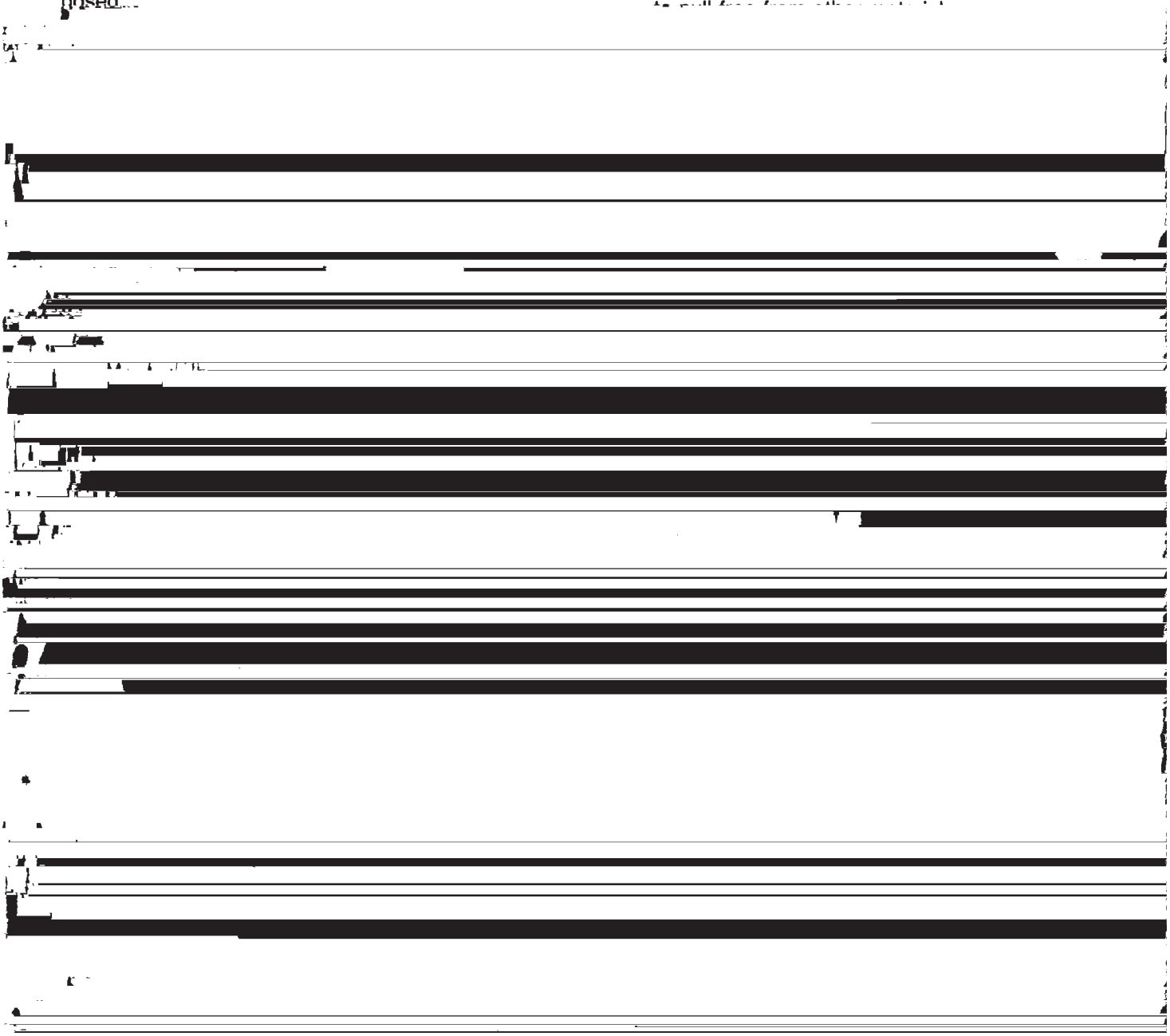
Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than



are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

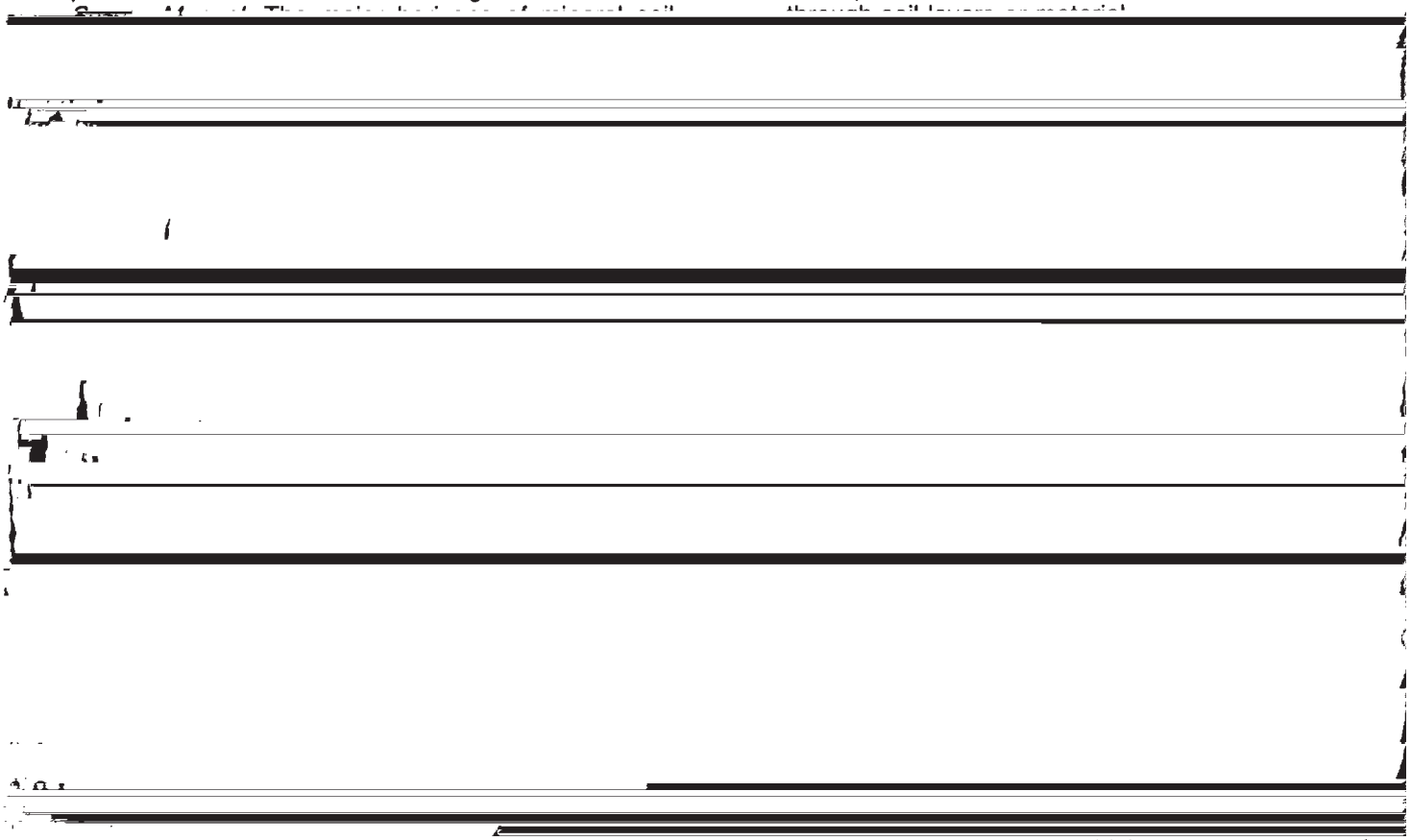
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

planation of the subdivisions is given in the *Soil*

with percolation, which is movement of water



are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

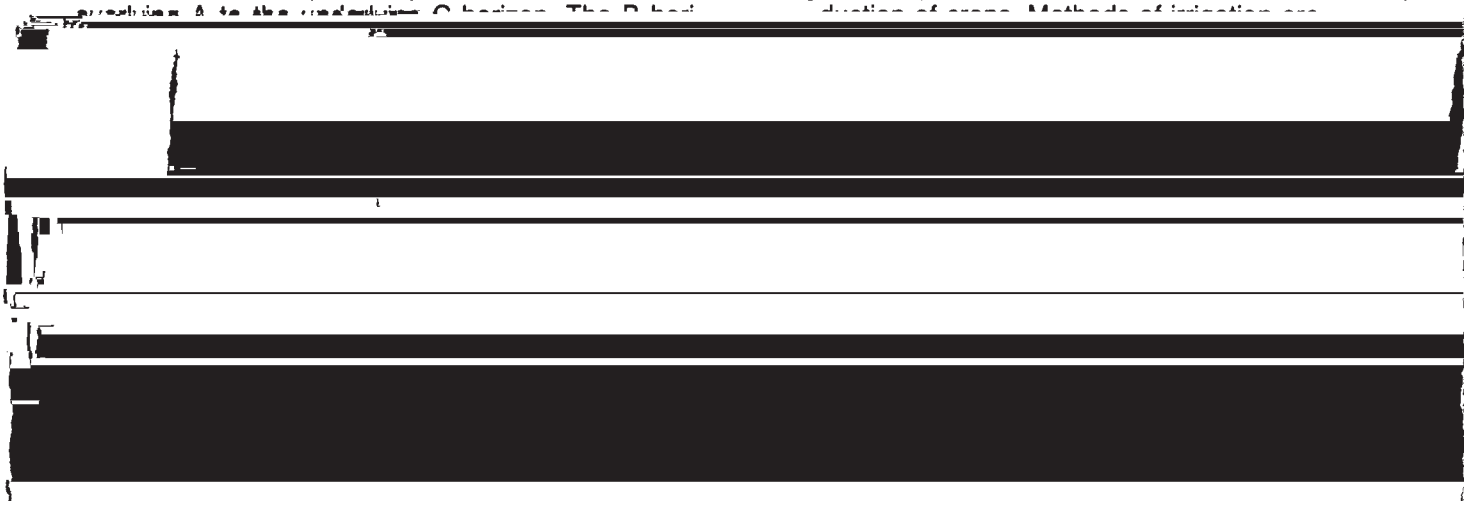
A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

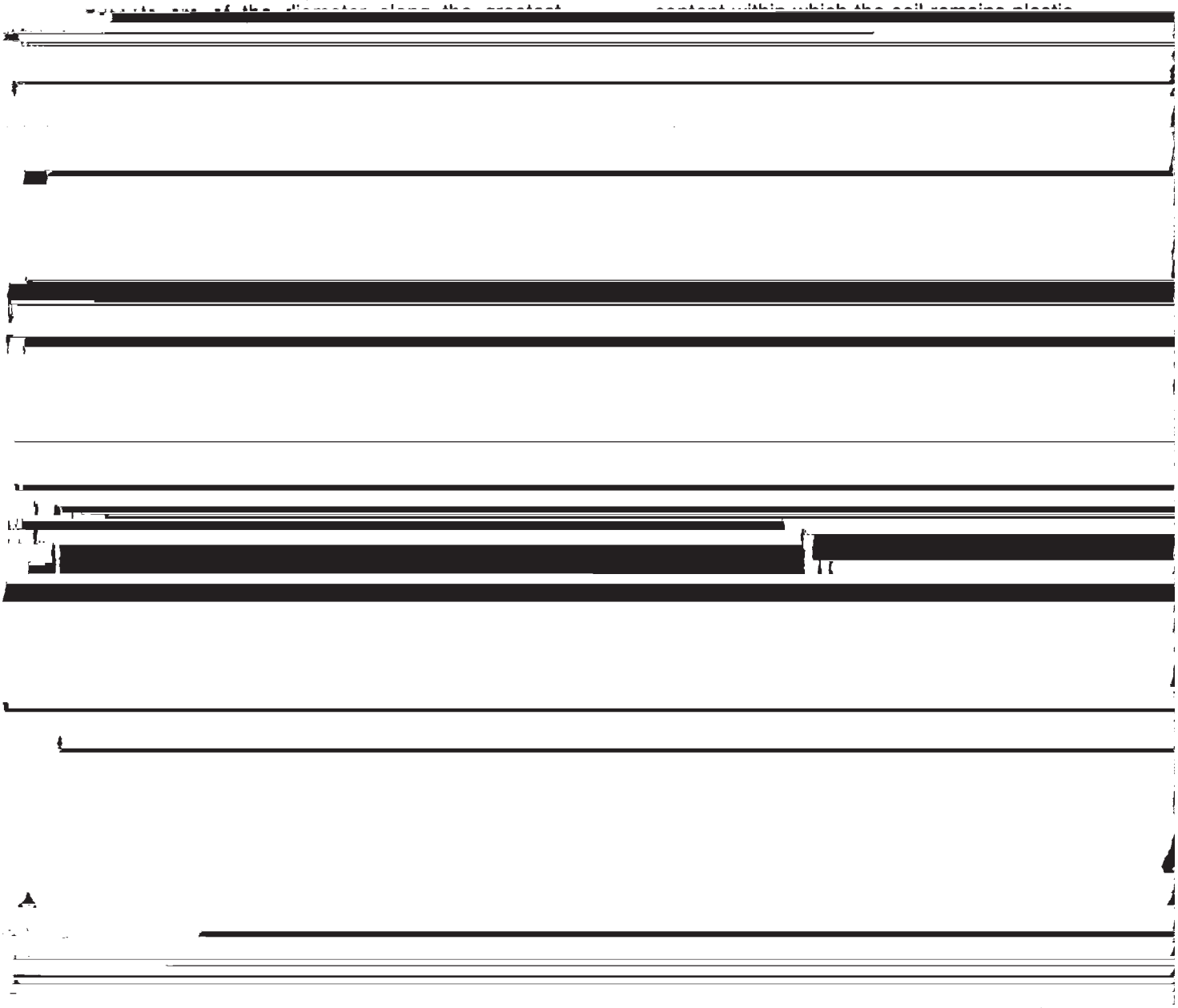
Irrigation. Application of water to soils to assist in pro-



aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size mea-

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture



dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity (soil). The capability of a soil for producing

[redacted]

erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a [redacted]

into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones [redacted]

the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam,*

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the low lands along streams.

Valley fill. In glaciated regions, material deposited in

TABLES

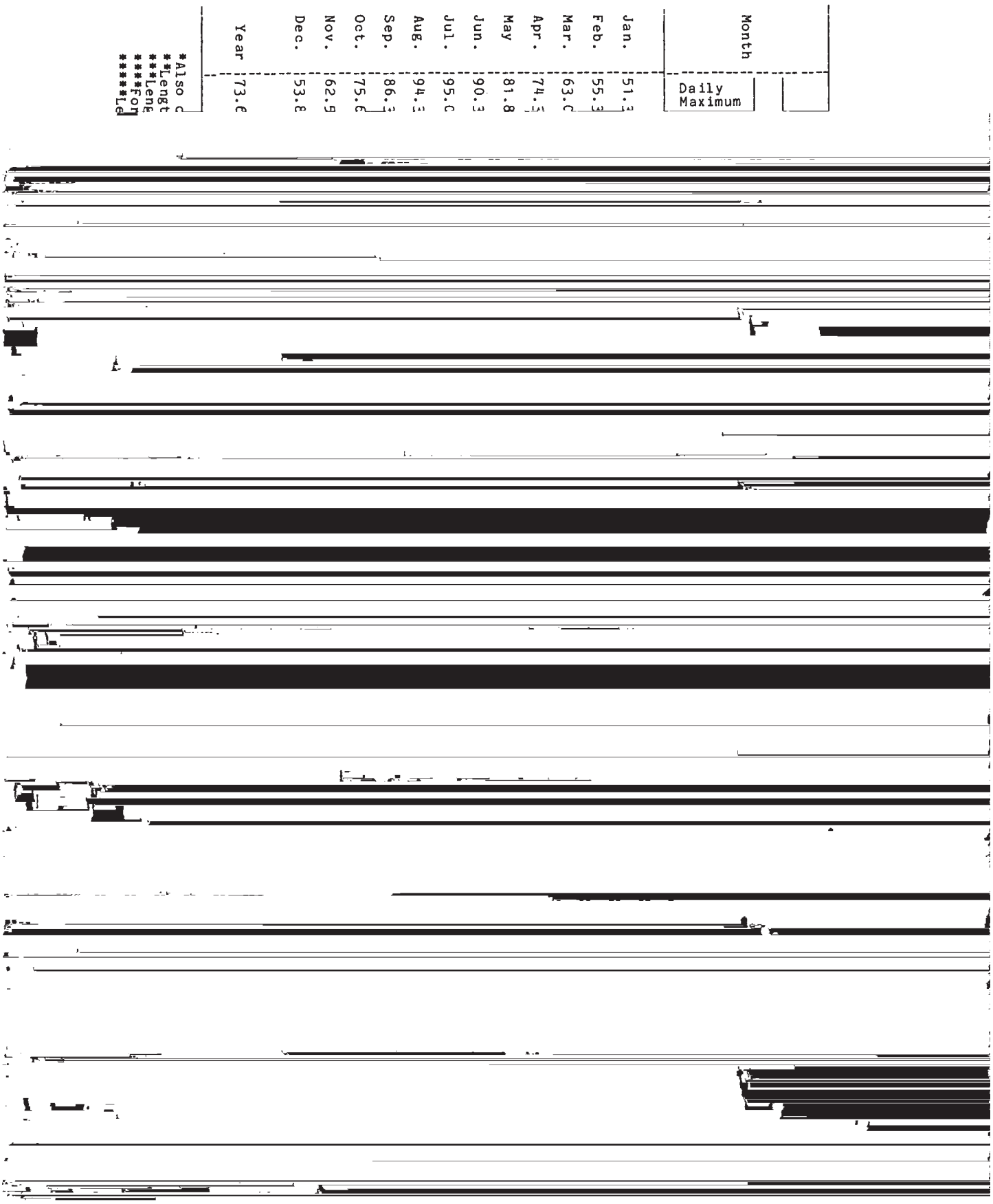

Month
Daily Maximum
Jan. 51.
Feb. 55.
Mar. 63.
Apr. 74.
May 81.8
Jun. 90.
Jul. 95.
Aug. 94.
Sep. 86.
Oct. 75.6
Nov. 62.9
Dec. 53.8
Year 73.6
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TABLE 2.--POTENTIALS AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR SPECIFIED USES

Map unit	Percent of county	Cultivated farm crops	Specialty crops	Rangeland	Urban uses	Recreation areas
1. Mobeetie-Veal-Potter	33	Low: slope, water erosion, depth to rock.	Low: slope, depth to rock, water erosion.	Medium: slope, water erosion, depth to rock.	Medium: slope, depth to rock.	Medium: slope, small stones.
2. Obaro-Aspermont-Quinlan	22	Low: slope, water erosion, depth to rock.	Low: slope, water erosion, depth to rock.	Medium: slope, water erosion, depth to rock.	Medium: slope, depth to rock.	Medium: slope, too clayey.
3. Miles-Veal-Acuff	17	Medium: low rainfall, slope, soil blowing, water erosion.	Medium: slope, water erosion, soil blowing.	High: soil blowing, water erosion.	High: low strenth, corrosivity, soil blowing.	High: slope, soil blowing.
4. Springer-Lincoln-Likes	12	Low: slope, available water capacity, soil blowing.	Low: slope, soil blowing, available water capacity, flooding.	Medium: slope, soil blowing, available water capacity.	Low: slope, seepage, flooding.	Low: too sandy, soil blowing, slope, flooding.
5. Miles-Springer	11	Medium: soil blowing, low rainfall.	Medium: soil blowing, slope, water erosion.	High: soil blowing, slope.	High: soil blowing, low strength, seepage.	Medium: too sandy, slope.
6. Pullman-Estacado-Olton	3	High: slow permeability, low rainfall, soil blowing.	High: slow permeability.	Medium: slow permeability, too clayey.	Medium: shrink-swell, corrosivity, low strength.	Medium: too clayey, soil blowing, slow permeability.
7. Olton-Acuff-Miles	2	High: low rainfall, slope, water erosion.	High: slope, water erosion.	High: water erosion, soil blowing.	High: low strength, corrosivity.	High: slope.

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Acuff loam, 0 to 1 percent slopes	1,970	0.3
2	Acuff loam, 1 to 3 percent slopes	8,400	1.4
3	Acuff loam, 3 to 5 percent slopes	4,400	0.8
4	Altus fine sandy loam, 0 to 1 percent slopes	5,820	1.0
5	Aspermont silty clay loam, 1 to 3 percent slopes	1,030	0.2
6	Aspermont silty clay loam, 3 to 5 percent slopes	11,050	1.9
7	Berda-Estacado-Potter association, rolling	11,040	1.9
8	Berda-Potter-Rock outcrop association, steep	15,500	2.7
9	Bippus clay loam, 0 to 1 percent slopes	390	0.1
10	Bippus clay loam, 1 to 3 percent slopes	980	0.2
11	Burson-Aspermont association, steep	12,300	2.1
12	Carey loam, 0 to 1 percent slopes	400	0.1
13	Carey loam, 1 to 3 percent slopes	2,310	0.4
14	Clairemont silt loam, occasionally flooded	1,770	0.3
15	Delwin fine sand, 0 to 3 percent slopes	3,960	0.7
16	Estacado clay loam, 0 to 1 percent slopes	1,710	0.3
17	Estacado clay loam, 1 to 3 percent slopes	1,110	0.2
18	Estacado clay loam, 3 to 5 percent slopes	2,220	0.4
19	Guadalupe fine sandy loam, occasionally flooded	6,610	1.1
20	Likes loamy fine sand, 1 to 8 percent slopes	10,670	1.8
21	Lincoln loamy fine sand, frequently flooded	20,800	3.6
22	Miles loamy fine sand, 0 to 3 percent slopes	35,730	6.1
23	Miles loamy fine sand, 3 to 5 percent slopes	4,380	0.8
24	Miles loamy fine sand, 3 to 8 percent slopes, severely eroded	1,290	0.2
25	Miles fine sandy loam, 0 to 1 percent slopes	7,770	1.3
26	Miles fine sandy loam, 1 to 3 percent slopes	46,550	8.0
27	Miles fine sandy loam, 3 to 5 percent slopes	30,090	5.2
29	Mobeetie fine sandy loam, 1 to 3 percent slopes	1,860	0.3
30	Mobeetie fine sandy loam, 3 to 5 percent slopes	7,610	1.3
31	Mobeetie fine sandy loam, 5 to 12 percent slopes	13,690	2.4

TABLE 4.--YIELDS PER ACRE OF CROPS

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Cotton lint		Wheat		Grain sorghum	
	N	I	N	I	N	I
	Lb	Lb	Bu	Bu	Bu	Bu
1---------- Acuff	200	900	18	50	25	120
2---------- Acuff	175	750	16	45	20	100
3---------- Acuff	150	600	14	40	15	80
4---------- Altus	350	900	30	60	40	110
5---------- Aspermont	200	600	15	40	20	80
6---------- Aspermont	150	---	12	30	15	---
7*:						
Berda----------	---	---	---	---	---	---
Estacado----------	---	---	---	---	---	---
Potter----------	---	---	---	---	---	---
8*:						
Berda----------	---	---	---	---	---	---
Potter----------	---	---	---	---	---	---
Rock outcrop.						
9**---------- Bippus	225	900	18	60	25	110
10---------- Bippus	200	750	16	50	20	100
11*:						
Burson----------	---	---	---	---	---	---
Aspermont----------	---	---	45	---	35	---
12---------- Carey	300	750	25	55	35	110
13---------- Carey	275	700	20	50	30	100
14---------- Clairemont	350	900	25	60	40	110
15---------- Delwin	225	600	18	40	25	80
16----------	200	750	18	45	25	100
17----------	175	500	15	40	20	90

TABLE 4.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Cotton lint		Wheat		Grain sorghum	
	N	I	N	I	N	I
	Lb	Lb	Bu	Bu	Bu	Bu
18---------- Estacado	125	---	12	35	15	70
19---------- Guadalupe	350	750	25	45	35	100
20---------- Likes	---	---	---	---	---	---
21---------- Lincoln	---	---	---	---	---	---
22---------- Miles	250	650	15	35	25	75
23---------- Miles	---	---	15	30	15	45
24---------- Miles	---	---	---	---	---	---
25---------- Miles	300	700	20	50	35	85
26---------- Miles	250	650	20	45	30	75
27---------- Miles	200	500	15	35	25	60
28---------- Miles	150	450	15	30	15	50
29---------- Mobeetie	175	650	12	35	15	60
30---------- Mobeetie	---	---	10	30	12	50
31---------- Mobeetie	---	---	---	---	---	---
32*: Mobeetie----------	---	---	---	---	---	---
Badland.						
33*: Mobeetie----------	---	---	---	---	---	---
Polar----------	---	---	---	---	---	---
34*: Mobeetie----------	---	---	---	---	---	---
Veal----------	---	---	---	---	---	---
Potter----------	---	---	---	---	---	---
35---------- Nobscot	---	---	---	---	25	---
36*: Obaro----------	---	---	---	---	---	---
Quinlan----------	---	---	---	---	---	---

See footnote at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Cotton lint		Wheat		Grain sorghum	
	N	I	N	I	N	I
	Lb	Lb	Bu	Bu	Bu	Bu
37--Olton	200	850	16	60	20	115
38--Olton	175	780	14	50	15	100
39--Paloduro	---	---	10	35	12	70
40--Paloduro	---	---	---	---	---	---
41--Potter	---	---	---	---	---	---
42--Pullman	200	850	15	60	20	120
43--Pullman	150	700	12	45	15	90
44--Randall	---	---	---	---	---	---
45--Springer	225	600	14	40	25	75
46--Springer	---	---	12	30	20	---
47--Springer	---	---	---	---	---	---
48--Springer	---	---	10	30	15	50
49--Spur	225	900	20	60	30	110
50--Sweetwater	---	---	---	---	---	---
51--Tivoli	---	---	---	---	---	---
52--Veal	150	400	12	25	20	55
53--Veal	125	---	10	20	15	45

* See description of the map unit for composition and behavior characteristics of the map unit.
** Yields are for areas protected from flooding.

TABLE 5.--CAPABILITY CLASSES AND SUBCLASSES

[All soils are assigned to nonirrigated capability subclasses (N). Only those soils that are suited to irrigation are assigned to irrigated subclasses (I). Miscellaneous areas are excluded. Dashes indicate no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I (N)	--	--	--	--	--
(I)	6,610	--	--	--	--
II (N)	26,860	16,880	9,190	--	790
(I)	89,300	67,820	9,190	12,290	--
III (N)	157,920	157,920	--	--	--
(I)	97,350	97,350	--	--	--
IV (N)	94,040	94,040	--	--	--
(I)	85,560	85,560	--	--	--
V (N)	22,060	--	22,060	--	--
VI (N)	184,930	170,060	1,920	12,950	--
VII (N)	64,365	38,885	--	25,480	--
VIII (N)	3,250	--	--	3,250	--

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

[Only the soils that support rangeland vegetation suitable for grazing are listed]

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
1, 2, 3---------- Acuff	Clay Loam----------	Favorable	2,200	Blue grama----------	30
		Normal	1,800	Buffalograss----------	25
		Unfavorable	1,200	Sideoats grama----------	5
				Vine-mesquite----------	10
				Tobosa----------	5
4---------- Altus	Sandy Loam----------	Favorable	3,800	Little bluestem----------	25
		Normal	2,800	Sand bluestem----------	20
		Unfavorable	2,000	Sideoats grama----------	15
				Blue grama----------	10
				Indiangrass----------	5
				Texas needlegrass----------	5
				Sand lovegrass----------	5
				Sand sagebrush----------	5
5, 6---------- Aspermont	Clay Loam----------	Favorable	2,000	Blue grama----------	25
		Normal	1,600	Buffalograss----------	15
		Unfavorable	1,200	Sideoats grama----------	10
				Vine-mesquite----------	10
				Arizona cottontop----------	5
				Texas needlegrass----------	5
				Sand dropseed----------	5
				Western wheatgrass----------	5
7*:					
Berda----------	Hardland Slopes----------	Favorable	2,800	Sideoats grama----------	35
		Normal	2,000	Blue grama----------	20
		Unfavorable	1,200	Little bluestem----------	5
				Buffalograss----------	5
				Threeawn----------	5
				Silver bluestem----------	5
				Plains bristlegrass----------	5
Estacado----------	Loamy----------	Favorable	2,300	Blue grama----------	30
		Normal	1,700	Sideoats grama----------	25
		Unfavorable	1,300	Buffalograss----------	15
				Vine mesquite----------	5
Potter----------	Very Shallow----------	Favorable	900	Sideoats grama----------	30
		Normal	700	Blue grama----------	10
		Unfavorable	400	Little bluestem----------	10
				Buffalograss----------	10
				Threeawn----------	5
				Hairy grama----------	5
				Black grama----------	5
8*:					
Berda----------	Rough Breaks----------	Favorable	1,400	Sideoats grama----------	25
		Normal	800	Little bluestem----------	15
		Unfavorable	400	Hairy grama----------	10
				Sand bluestem----------	5
				Indiangrass----------	5
				Blue grama----------	5
				Black grama----------	5
				Silver bluestem----------	5
Potter----------	Very Shallow----------	Favorable	900	Sideoats grama----------	30
		Normal	700	Blue grama----------	10
		Unfavorable	400	Little bluestem----------	10
				Buffalograss----------	10
				Threeawn----------	5
				Hairy grama----------	5
				Black grama----------	5
Rock outcrop.					

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
9, 10---------- Bippus	Draw----------	Favorable	3,000	Sideoats grama----------	25
		Normal	2,400	Vine-mesquite----------	10
		Unfavorable	1,800	Blue grama----------	10
				Western wheatgrass----------	10
				Little bluestem----------	5
				Arizona cottontop----------	5
				Plains bristlegrass----------	5
				White tridens----------	5
				Buffalograss----------	5
11*:					
Burson----------	Rough Breaks----------	Favorable	700	Sideoats grama----------	20
		Normal	500	Little bluestem----------	15
		Unfavorable	300	Blue grama----------	10
				Sand bluestem----------	5
				Threeawn----------	5
				Hairy grama----------	5
Aspermont----------	Rough Breaks----------	Favorable	2,000	Blue grama----------	25
		Normal	1,600	Buffalograss----------	15
		Unfavorable	1,200	Sideoats grama----------	10
				Vine-mesquite----------	10
				Arizona cottontop----------	5
				Texas needlegrass----------	5
				Sand dropseed----------	5
				Western wheatgrass----------	5
12, 13---------- Carey	Loamy Prairie----------	Favorable	2,600	Blue grama----------	20
		Normal	2,100	Sideoats grama----------	15
		Unfavorable	1,600	Buffalograss----------	15
				Arizona cottontop----------	5
				Plains bristlegrass----------	5
				Vine-mesquite----------	5
				Texas needlegrass----------	5
				Sand dropseed----------	5
				Hairy grama----------	5
14---------- Clairemont	Loamy Bottomland----------	Favorable	3,400	Sideoats grama----------	20
		Normal	2,600	Sand bluestem----------	10
		Unfavorable	1,800	Indiangrass----------	10
				Vine-mesquite----------	10
				Switchgrass----------	5
				Little bluestem----------	5
				Western wheatgrass----------	5
				Arizona cottontop----------	5
				Texas needlegrass----------	5
				Plains bristlegrass----------	5
15---------- Delwin	Sandy----------	Favorable	3,200	Little bluestem----------	30
		Normal	2,400	Sand bluestem----------	15
		Unfavorable	1,500	Sideoats grama----------	5
				Switchgrass----------	5
				Indiangrass----------	5
				Plains bristlegrass----------	5
				Sand lovegrass----------	5
				Sand dropseed----------	5
16, 17, 18---------- Estacado	Loamy----------	Favorable	2,300	Blue grama----------	30
		Normal	1,700	Sideoats grama----------	25
		Unfavorable	1,300	Buffalograss----------	15
				Silver bluestem----------	5
				Threeawn----------	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
19---------- Guadalupe	Sandy Bottomland----------	Favorable Normal Unfavorable	4,000 3,000 2,000	Little bluestem---------- Switchgrass---------- Vine-mesquite---------- Indiangrass---------- Sideoats grama---------- Canada wildrye---------- Sand bluestem---------- Blue grama---------- Western wheatgrass---------- Arizona cottontop---------- Texas needlegrass---------- Plains bristlegrass----------	10 10 10 5 5 5 5 5 5 5 5 5
20---------- Likes	Loamy Sand----------	Favorable Normal Unfavorable	3,000 2,100 1,300	Little bluestem---------- Sand bluestem---------- Sideoats grama---------- Indiangrass---------- Sand lovegrass---------- Switchgrass---------- Canada wildrye---------- Sand sagebrush----------	20 15 15 10 10 10 5 5
21---------- Lincoln	Sandy Bottomland----------	Favorable Normal Unfavorable	3,000 2,280 1,800	Switchgrass---------- Sand bluestem---------- Indiangrass---------- Little bluestem---------- Texas bluegrass---------- Sedges and rushes---------- Heath aster---------- Tamarisk----------	30 15 15 5 5 5 5 5
22, 23, 24--------- Miles	Loamy Sand----------	Favorable Normal Unfavorable	3,200 2,300 1,500	Little bluestem---------- Sand bluestem---------- Sideoats grama---------- Indiangrass---------- Arizona cottontop---------- Silver bluestem---------- Sand lovegrass---------- Switchgrass---------- Sand sagebrush----------	15 15 10 10 5 5 5 5 5
25, 26, 27, 28----- Miles	Sandy Loam----------	Favorable Normal Unfavorable	2,800 2,250 1,800	Blue grama---------- Sideoats grama---------- Plains bristlegrass---------- Arizona cottontop---------- Little bluestem---------- Silver bluestem---------- Buffalograss---------- Vine-mesquite----------	20 20 10 10 5 5 5 5
29, 30, 31--------- Mobeetie	Mixedland Slopes----------	Favorable Normal Unfavorable	3,000 2,250 1,500	Sideoats grama---------- Blue grama---------- Little bluestem---------- Sand bluestem---------- Buffalograss---------- Sand dropseed---------- Indiangrass---------- Hairy grama----------	30 15 10 5 5 5 5 5
32*: Mobeetie----------	Mixedland Slopes----------	Favorable Normal Unfavorable	3,000 2,250 1,500	Sideoats grama---------- Blue grama---------- Little bluestem---------- Sand bluestem---------- Buffalograss---------- Sand dropseed---------- Indiangrass---------- Hairy grama----------	30 15 10 5 5 5 5 5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
33*:					
Mobeetie	Mixedland Slopes	Favorable	3,000	Sideoats grama	30
		Normal	2,250	Blue grama	15
		Unfavorable	1,500	Little bluestem	10
				Sand bluestem	5
				Buffalograss	5
				Sand dropseed	5
				Indiangrass	5
				Hairy grama	5
Polar	Gravelly	Favorable	1,500	Sideoats grama	30
		Normal	1,100	Little bluestem	15
		Unfavorable	700	Black grama	10
				Sand bluestem	5
				Blue grama	5
				Canada wildrye	5
				Indiangrass	5
				Hairy grama	5
34*:					
Mobeetie	Mixedland Slopes	Favorable	3,000	Sideoats grama	30
		Normal	2,250	Blue grama	15
		Unfavorable	1,500	Little bluestem	10
				Sand bluestem	5
				Buffalograss	5
				Sand dropseed	5
				Indiangrass	5
				Hairy grama	5
Veal	Loamy	Favorable	2,800	Sideoats grama	30
		Normal	2,100	Blue grama	15
		Unfavorable	1,400	Buffalograss	10
				Little bluestem	5
				Sand dropseed	5
				Plains bristlegrass	5
Potter	Very Shallow	Favorable	900	Sideoats grama	30
		Normal	700	Blue grama	10
		Unfavorable	400	Little bluestem	10
				Buffalograss	10
				Rough tridens	5
				Hairy grama	5
35 Nobscot	Sandy	Favorable	3,900	Little bluestem	25
		Normal	2,800	Sand bluestem	20
		Unfavorable	2,000	Indiangrass	5
				Switchgrass	5
				Sand lovegrass	5

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
36*:					
Quinlan	Loamy Prairie	Favorable	2,500	Little bluestem	30
		Normal	1,800	Sand bluestem	15
		Unfavorable	1,300	Indiangrass	10
				Sideoats grama	5
				Prairie-clover	5
				Dotted gayfeather	5
37, 38	Clay Loam	Favorable	2,100	Blue grama	35
Olton		Normal	1,600	Buffalograss	25
		Unfavorable	1,200	Vine-mesquite	10
				Western wheatgrass	10
				Sideoats grama	5
39, 40	Hardland Slopes	Favorable	2,800	Blue grama	30
Paloduro		Normal	2,000	Sideoats grama	15
		Unfavorable	1,200	Buffalograss	10
				Vine-mesquite	5
				Little bluestem	5
				Silver bluestem	5
				Wright threeawn	5
				Sand dropseed	5
41	Very Shallow	Favorable	900	Sideoats grama	30
Potter		Normal	700	Blue grama	10
		Unfavorable	400	Little bluestem	10
				Buffalograss	10
				Threeawn	5
				Hairy grama	5
42, 43	Clay Loam	Favorable	2,000	Blue grama	40
Pullman		Normal	1,500	Buffalograss	25
		Unfavorable	1,000	Sideoats grama	5
				Western wheatgrass	5
				Vine-mesquite	5
				Silver bluestem	5
44	Lakebed	Favorable	3,000	Pennsylvania smartweed	20
Randall		Normal	1,200	Blue grama	15
		Unfavorable	500	Common spikesedge	15
				Buffalograss	15
				Western wheatgrass	10
				Knotgrass	5
45, 46, 47	Loamy Sand	Favorable	3,300	Little bluestem	15
Springer		Normal	2,500	Sand bluestem	15
		Unfavorable	1,600	Sideoats grama	10
				Plains bristlegrass	10
				Indiangrass	10
				Sand lovegrass	5
				Sand dropseed	5
				Canada wildrye	5
				Switchgrass	5
48	Sandy Loam	Favorable	3,200	Sideoats grama	20
Springer		Normal	2,400	Blue grama	20
		Unfavorable	1,600	Little bluestem	10
				Plains bristlegrass	10
				Arizona cottontop	5
				Vine-mesquite	5
				Sand dropseed	5
				Buffalograss	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
49---------- Spur	Draw----------	Favorable Normal Unfavorable	3,000 2,400 1,800	Sideoats grama---------- Vine-mesquite---------- Blue grama---------- Western wheatgrass---------- Little bluestem---------- Switchgrass---------- White tridens---------- Buffalograss----------	25 10 10 10 5 5 5 5
50* [redacted]	Wet Bottomland	Favorable	5,000	Switchgrass----------	15

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having a predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1, 2, 3---------- Acuff	---	Green ash, osageorange, Russian-olive, Arizona cypress, Rocky Mt. juniper.	Honeylocust, oriental arborvitae.	Siberian elm------	---
4---------- Altus	---	---	---	Eastern redcedar, Austrian pine.	Eastern cottonwood, Siberian elm, American sycamore.
5, 6---------- Aspermont	---	Osageorange, eastern redcedar, oriental arborvitae.	Siberian elm------	---	---
7*: Berda----------	---	Osageorange, eastern redcedar, oriental arborvitae.	---	Siberian elm------	---
Estacado--------- Potter.	---	Osageorange, eastern redcedar, oriental arborvitae, Rocky Mt. juniper.	---	Siberian elm------	---
8*: Berda----------	---	Osageorange, eastern redcedar, oriental arborvitae.	---	Siberian elm------	---
Potter. Rock outcrop.					
9, 10---------- Bippus	---	Russian-olive, eastern redcedar, Rocky Mt. juniper.	Green ash, osageorange, oriental arborvitae, Arizona cypress.	Siberian elm, honeylocust.	---
11*: Burson.					
Aspermont--------	---	Osageorange, eastern redcedar, oriental arborvitae.	Siberian elm------	---	---
12, 13---------- Carey	---	Russian-olive-----	Green ash, honeylocust, osageorange, eastern redcedar, oriental arborvitae, Arizona cypress.	Siberian elm------	---

See footnote at end of table.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having a predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
14---------- Clairemont	---	---	---	Austrian pine, ponderosa pine, eastern redcedar, shortleaf pine.	Eastern cottonwood, loblolly pine, green ash.
15---------- Delwin	---	Russian-olive, eastern redcedar, Rocky Mt. juniper.	Green ash, osageorange, oriental arborvitae, Arizona cypress.	Siberian elm, honeylocust.	---
16, 17, 18-------- Estacado	---	Osageorange, eastern redcedar, oriental arborvitae, Rocky Mt. juniper.	---	Siberian elm------	---
19. Guadalupe					
20. Likes					
21. Lincoln					
22, 23, 24, 25, 26, 27, 28------- Miles	---	Russian-olive, eastern redcedar, Rocky Mt. juniper.	Green ash, osageorange, oriental arborvitae, Arizona cypress.	Siberian elm, honeylocust.	---
29, 30, 31-------- Mobeetie	---	Eastern redcedar, Russian-olive, osageorange.	Arizona cypress, oriental arborvitae, green ash, honeylocust.	Siberian elm------	---
32*: Mobeetie-------- Badland.	---	Eastern redcedar, Russian-olive, osageorange.	Arizona cypress, oriental arborvitae, green ash, honeylocust.	Siberian elm------	---
33*: Mobeetie-------- Polar.	---	Eastern redcedar, Russian-olive, osageorange.	Arizona cypress, oriental arborvitae, green ash, honeylocust.	Siberian elm------	---
34*: Mobeetie-------- Veal---------- Potter.	--- ---	Eastern redcedar, Russian-olive, osageorange. Oriental arborvitae, Rocky Mt. juniper, Russian-olive, osageorange, eastern redcedar.	Arizona cypress, oriental arborvitae, green ash, honeylocust. Honeylocust, Siberian elm.	Siberian elm------ ---	--- ---

See footnote at end of table.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having a predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
35---------- Nobscot	---	---	Eastern redcedar, Austrian pine.	---	Siberian elm.
36*: Obaro----------	---	Oriental arborvitae, Rocky Mt. juniper, Russian-olive, eastern redcedar, osageorange.	Siberian elm------	---	---
Quinlan----------	---	---	---	---	---
37, 38---------- Olton	---	Green ash, osageorange, Russian-olive, eastern redcedar, Arizona cypress.	Honeylocust, oriental arborvitae.	Siberian elm------	---
39, 40---------- Paloduro	---	Osageorange, eastern redcedar, [illegible] arborvitae.	Honeylocust, Arizona cypress.	Siberian elm------	---
41. Potter					
42, 43---------- Pullman	---	Osageorange, Russian-olive.	Eastern redcedar, honeylocust, Arizona cypress, oriental arborvitae.	Siberian elm------	---
44. Randall					
45, 46, 47, 48---- Springer	---	Russian-olive, eastern redcedar.	Green ash, osageorange, oriental arborvitae, Arizona cypress.	Siberian elm, honeylocust.	---
49---------- Spur	---	Russian-olive, eastern redcedar.	Green ash, osageorange, oriental arborvitae, Arizona cypress.	Siberian elm, honeylocust.	---
50*. Sweetwater					
51. Tivoli					
52, 53---------- Veal	---	Oriental arborvitae, Rocky Mt. juniper, Russian-olive, osageorange, eastern redcedar.	Honeylocust, Siberian elm.	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
1, 2---------- Acuff	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
3---------- Acuff	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.
4---------- Altus	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
5---------- Aspermont	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: low strength, shrink-swell.
6---------- Aspermont	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Moderate: low strength, shrink-swell.
7*: Berda----------	Moderate: slope.	Moderate: slope, low strength.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.
Estacado---------	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength, slope.
Potter----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
8*: Berda----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Potter----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Rock outcrop.					
9, 10---------- Bippus	Slight----------	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Severe: floods.
11*: Burson----------	Severe: depth to rock, slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Aspermont--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
12, 13---------- Carey	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
14---------- Clairemont	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
15---------- Delwin	Slight----------	Slight----------	Slight----------	Slight----------	Slight.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
16, 17---------- Estacado	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
18---------- Estacado	Slight----------	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.
19----------	Severe:	Severe:	Severe:	Severe:	Moderate:
20---------- Likes	Severe: cutbanks cave.	Slight----------	Slight----------	Moderate: slope.	Slight.
21---------- Lincoln	Severe: cutbanks cave, floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
22---------- Miles	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: low strength.
23, 24---------- Miles	Slight----------	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
25, 26---------- Miles	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: low strength.
27, 28---------- Miles	Slight----------	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
29---------- Mobeetie	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
30---------- Mobeetie	Slight----------	Slight----------	Slight----------	Moderate: slope.	Slight.
31---------- Mobeetie	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
32*: Mobeetie---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Badland.					
33*: Mobeetie---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Polar----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
34*: Mobeetie---------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Seere: slope.	Moderate: slope.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
36*: Quinlan	Moderate: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.
37, 38 Olton	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: low strength, shrink-swell.
39, 40 Paloduro	Slight	Slight	Slight	Moderate: slope.	Slight.
41 Potter	Slight	Slight	Slight	Moderate: slope.	Slight.
42, 43 Pullman	Severe: too clayey, cutbanks cave.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
44 Randall	Severe: too clayey, wetness.	Severe: shrink-swell, wetness, floods.	Severe: shrink-swell, wetness, floods.	Severe: shrink-swell, wetness, floods.	Severe: shrink-swell, wetness, floods.
45 Springer	Severe: cutbanks cave.	Slight	Slight	Slyght	Slight.
46, 47 Springer	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight.
48 Springer	Slight	Slight	Slight	Moderate: slope.	Slight.
49 Spur	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength.
50* Sweetwater	Severe: cutbanks cave, floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
51 Tivoli	Severe: cutbanks cave, too sandy.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
52 Veal	Slight	Slight	Slight	Slight	Moderate: low strength.
53 Veal	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1 Acuff	Slight	Moderate: seepage.	Slight	Slight	Good.
2, 3 Acuff	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
4 Altus	Slight	Moderate: seepage.	Slight	Slight	Good.
5, 6 Aspermont	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
7*: Berda	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.	Fair: slope.
Estacado	Slight	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Potter	Moderate: slope.	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
8*: Berda	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
Potter	Moderate: slope.	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
Rock outcrop.					
9 Bippus	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
15--Delwin	Slight	Moderate: seepage.	Slight	Slight	Poor: too sandy.
16--Estacado	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
17, 18--Estacado	Slight	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
19--Guadalupe	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: seepage, floods.	Good.
20--Likes	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
21--Lincoln	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage, too sandy.	Severe: floods, seepage.	Fair: too sandy.
22--Miles	Slight	Moderate: seepage.	Slight	Slight	Good.
23, 24--Miles	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
25--Miles	Slight	Moderate: seepage.	Slight	Slight	Good.
26, 27, 28--Miles	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
29, 30--Mobeetie	Slight	Severe: seepage.	Severe: seepage.	Slight	Good.
31--Mobeetie	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Moderate: slope.	Fair: slope.
32*:					
Mobeetie	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope.	Poor: slope.
Badland.					
33*:					
Mobeetie	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope.	Poor: slope.
Polar	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: slope.
34*:					
Mobeetie	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Moderate: slope.	Fair: slope.
Veal	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.	Fair: slope.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
34*: Potter	Slight	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
35---- Nobscot	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
36*: Obaro	Moderate: percs slowly, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: slope.	Fair: thin layer.
Quinlan	Severe: depth to rock.	Severe: seepage, slope.	Moderate: depth to rock, seepage.	Severe: seepage.	Poor: thin layer.
37---- Olton	Moderate: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: too clayey.
38---- Olton	Moderate: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
39, 40---- Paloduro	Slight	Moderate: seepage.	Slight	Slight	Good.
41---- Potter	Slight	Severe: seepage, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
42---- Pullman	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey.
43---- Pullman	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
44---- Randall	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: floods.	Poor: too clayey, wetness.
45, 46, 47---- Springer	Slight	Severe: seepage.	Slight	Slight	Fair: too sandy.
48---- Springer	Slight	Severe: seepage.	Slight	Slight	Good.
49---- Spur	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
50*---- Sweetwater	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
51---- Tivoli	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
52, 53---- Veal	Slight	Moderate: slope, seepage.	Slight	Slight	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1, 2, 3---------- Acuff	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
4---------- Altus	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
5, 6---------- Aspermont	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
7*:				
	low strength.	excess fines.	excess fines.	slope.
Estacado----------	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Potter----------	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, small stones.
8*:				
Berda----------	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Potter----------	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, small stones.
Rock outcrop.				
9, 10---------- Bippus	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
11*:				

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
[redacted]				
25, 26, 27, 28--------- Miles	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
29, 30----------------- Mobeetie	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Good.
31--------------------- Mobeetie	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
32*: Mobeetie------------- Badland.	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
33*: Mobeetie------------- Polar-----------------	Fair: slope. Moderate: slope.	Unsuited: excess fines. Poor: excess fines.	Unsuited: excess fines. Fair: excess fines.	Fair: slope. Poor: small stones.
34*: Mobeetie------------- Veal------------------ Potter----------------	Good---------- Fair: low strength. Good----------	Unsuited: excess fines. Unsuited: excess fines. Unsuited: excess fines.	Unsuited: excess fines. Unsuited: excess fines. Unsuited: excess fines.	Fair: slope. Fair: excess lime. Poor: thin layer,

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
48--Springer	Good	Poor: excess fines.	Unsuited: excess fines.	Good.
49--Spur	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
50*--Sweetwater	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: wetness.
51--Tivoli	Good	Fair	Unsuited: excess fines.	Poor: too sandy.
52, 53--Veal	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: excess lime.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Irrigation	Terraces and diversions	Grassed waterways
1, 2, 3---------- Acuff	Moderate: seepage.	Slight---------	Severe: no water.	Favorable------	Favorable------	Favorable.
4---------- Altus	Moderate: seepage.	Moderate: unstable fill, piping, compressible.	Severe: no water.	Favorable------	Favorable------	Favorable.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Irrigation	Terraces and diversions	Grassed waterways
20---------- Likes	Severe: seepage.	Severe: erodes easily, seepage, piping.	Severe: deep to water.	Erodes easily, fast intake.	Too sandy------	Erodes easily.
21---------- Lincoln	Severe: seepage.	Severe: seepage.	Severe: no water.	Fast intake, floods, soil blowing.	Not needed-----	Droughty.
22, 23, 24, 25, 26, 27, 28------- Miles	Moderate: seepage.	Slight---------	Severe: no water.	Fast intake, soil blowing, slope.	Soil blowing---	Favorable.
29, 30, 31-------- Mobeetie	Severe: seepage.	Moderate: piping, seepage.	Severe: no water.	Complex slope, fast intake, erodes easily.	Complex slope, erodes easily, too sandy.	Droughty, erodes easily, slope.
32*: Mobeetie---------	Severe: seepage.	Moderate: piping, seepage.	Severe: no water.	Complex slope, fast intake, erodes easily.	Complex slope, erodes easily, too sandy.	Droughty, erodes easily, slope.
Badland.						
33*: Mobeetie---------	Severe: seepage.	Moderate: piping, seepage.	Severe: no water.	Complex slope, fast intake, erodes easily.	Complex slope, erodes easily, too sandy.	Droughty, erodes easily, slope.
Polar----------	Severe: seepage.	Moderate: piping, seepage.	Severe: no water.	Complex slope, droughty, fast intake.	Complex slope, piping.	Droughty, slope, erodes easily.
34*: Mobeetie---------	Severe: seepage.	Moderate: piping, seepage.	Severe: no water.	Complex slope, fast intake, erodes easily.	Complex slope, erodes easily, too sandy.	Droughty, erodes easily, slope.
Veal----------	Moderate: seepage.	Moderate: low strength, piping.	Severe: no water.	Complex slope, droughty, excess lime.	Erodes easily, slope.	Droughty, erodes easily, slope.
Potter----------	Severe: seepage.	Severe: thin layer, seepage.	Severe: no water.	Rooting depth, droughty, complex slope.	Slope, rooting depth.	Droughty, rooting depth, slope.
35---------- Nobscot	Severe: seepage.	Moderate: unstable fill, compressible, piping.	Severe: no water.	Fast intake, seepage, droughty.	Not needed-----	Droughty, erodes easily, fast intake.
36*: Obaro----------	Severe: depth to rock.	Moderate: thin layer.	Severe: no water.	Rooting depth, complex slope.	Depth to rock, erodes easily, slope.	Erodes easily, slope.
Quinlan----------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Droughty, slope, rooting depth.	Depth to rock, slope.	Droughty, slope, rooting depth.
37, 38---------- Olton	Moderate: seepage.	Moderate: piping.	Severe: no water.	Slow intake----	Favorable------	Favorable.
39, 40---------- Paloduro	Moderate: seepage.	Moderate: piping, erodes easily.	Severe: no water.	Favorable------	Favorable------	Favorable.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Irrigation	Terraces and diversions	Grassed waterways
41---------- Potter	Severe: seepage.	Severe: thin layer, seepage.	Severe: no water.	Rooting depth, droughty, complex slope.	Slope, rooting depth.	Droughty, rooting depth, slope.
42, 43---------- Pullman	Slight----------	Moderate: shrink-swell, low strength.	Severe: no water.	Slow intake----	Favorable------	Favorable.
44---------- Randall	Slight----------	Moderate: unstable fill, hard to pack.	Severe: deep to water.	Slow intake, wetness.	Not needed-----	Not needed.
45, 46, 47, 48---- Springer	Severe: seepage.	Moderate: seepage, piping.	Severe: deep to water.	Fast intake, erodes easily.	Too sandy, erodes easily.	Erodes easily.
49---------- Spur	Moderate: seepage.	Moderate: low strength, shrink-swell.	Severe: deep to water.	Favorable------	Favorable------	Favorable.
50*---------- Sweetwater	Severe: seepage.	Moderate: low strength, unstable fill.	Slight----------	Floods, wetness.	Floods, wetness.	Wetness.
51---------- Tivoli	Severe: seepage.	Severe: unstable fill, seepage, piping.	Severe: deep to water.	Complex slope, erodes easily, droughty.	Complex slope, erodes easily, fast intake.	Erodes easily, droughty, seepage.
52, 53---------- Veal	Moderate: seepage.	Moderate: low strength, piping.	Severe: no water.	Complex slope, droughty, excess lime.	Erodes easily, slope.	Droughty, erodes easily, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
1 Acuff	Slight	Slight	Slight	Slight.
2, 3 Acuff	Slight	Slight	Moderate: slope.	Slight.
4 Altus	Slight	Slight	Slight	Slight.
5, 6 Aspermont	Slight	Slight	Moderate: too clayey, slope.	Slight.
7*: Berda	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Estacado	Slight	Slight	Severe: slope.	Slight.
Potter	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
8*: Berda	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Potter	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Rock outcrop.				
9 Bippus	Severe: floods.	Moderate: floods, too clayey.	Severe: floods.	Moderate: too clayey.
10 Bippus	Severe: floods.	Moderate: floods, too clayey.	Moderate: too clayey.	Moderate: too clayey.
11*: Burson	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.
Aspermont	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
12 Carey	Slight	Slight	Slight	Slight.
13 Carey	Slight	Slight	Moderate: slope.	Slight.
14 Clairemont	Severe: floods.	Slight	Moderate: floods.	Slight.
15 Delnorte	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
17, 18---------- Estacado	Moderate: too clayey.	Moderate: too clayey.	Moderate: slope, too clayey.	Moderate: too clayey.
19---------- Guadalupe	Severe: floods.	Slight----------	Moderate: floods.	Slight.
20---------- Likes	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
21---------- Lincoln	Severe: floods.	Moderate: too sandy, floods.	Severe: floods.	Moderate: floods, too sandy.
22---------- Miles	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
23, 24---------- Miles	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
25---------- Miles	Slight----------	Slight----------	Slight----------	Slight.
26, 27, 28---------- Miles	Slight----------	Slight----------	Moderate: slope.	Slight.
29, 30---------- Mobeetie	Slight----------	Slight----------	Moderate: slope.	Slight.
31---------- Mobeetie	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
32*: Mobeetie---------- Badland.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
33*: Mobeetie---------- Polar----------	Severe: slope. Severe: slope.	Severe: slope. Severe: slope.	Severe: slope. Severe: slope, small stones.	Moderate: slope. Moderate: small stones.
34*: Mobeetie---------- Veal---------- Potter----------	Moderate: slope. Moderate: slope. Moderate: slope.	Moderate: slope. Moderate: slope. Moderate: slope.	Severe: slope. Severe: slope. Severe: slope.	Slight. Slight. Slight.
35---------- Nobscot	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
36*: Obaro---------- Quinlan----------	Moderate: slope. Moderate: slope.	Moderate: slope. Moderate: slope.	Severe: slope. Severe: depth to rock, slope.	Slight. Slight.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
37, 38--- Olton	Moderate: percs slowly.	Moderate: too clayey.	Moderate: percs slowly.	Moderate: too clayey.
39--- Paloduro	Slight---	Slight---	Moderate: slope.	Slight.
40--- Paloduro	Slight---	Slight---	Severe: slope.	Slight.
41--- Potter	Slight---	Slight---	Moderate: slope, small stones.	Slight.
42, 43--- Pullman	Moderate: percs slowly, too clayey.	Moderate: too clayey.	Moderate: percs slowly, too clayey.	Moderate: too clayey.
44--- Randall	Severe: wetness, too clayey.	Severe: wetness, too clayey.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
45--- Springer	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
46, 47--- Springer	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
48--- Springer	Slight---	Slight---	Severe: slope.	Slight.
49--- Spur	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
50*--- Sweetwater	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.
51--- Tivoli	Severe: too sandy, dusty.	Severe: too sandy, dusty.	Severe: too sandy, dusty.	Severe: too sandy, dusty.
52, 53--- Veal	Slight---	Slight---	Moderate: slope.	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Wetland wildlife	Rangeland wildlife
1, 2, 3---------- Acuff	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
4---------- Altus	Good	Good	Good	Good	Poor	Very poor	Good	Very poor	Good.
5, 6---------- Aspermont	Fair	Good	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
7*:									
Berda----------	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
Estacado----------	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
Potter----------	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor.
8*:									
Berda----------	Very poor	Very poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Potter----------	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor.
Rock outcrop.									
9---------- Bippus	Good	Good	Good	Good	Very poor	Very poor	Good	Very poor	Good.
10---------- Bippus	Fair	Good	Good	Good	Very poor	Very poor	Good	Very poor	Good.
11*:									
Burson----------	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor.
Aspermont---------	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
12, 13---------- Carey	Good	Good	Fair	Fair	Very poor	Very poor	Good	Very poor	Fair.
14---------- Clairemont	Good	Good	Fair	Good	Very poor	Very poor	Good	---	Fair.
15---------- Delwin	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
16, 17, 18--------- Estacado	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
19---------- Guadalupe	Good	Good	Good	Good	Very poor	Very poor	Good	Very poor	Good.
20---------- Likes	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
21---------- Lincoln	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
22, 23, 24--------- Miles	Fair	Good	Good	Good	Very poor	Very poor	Good	Very poor	Good.
25, 26, 27, 28----- Miles	Fair	Good	Good	Good	Very poor	Very poor	Good	Very poor	Good.
29, 30---------- Mobeetie	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Wetland wildlife	Rangeland wildlife
31---------- Mobeetie	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
32*: Mobeetie----------	Very poor	Very poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Badland.									
33*: Mobeetie----------	Very poor	Very poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Polar----------	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
34*: Mobeetie----------	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
Veal----------	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
Potter----------	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor
35---------- Nobscot	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
36*: Obaro----------	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
Quinlan----------	Poor	Poor	Fair	Poor	Very poor	Very poor	Fair	Very poor	Poor.
37, 38---------- Olton	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
39, 40---------- Paloduro	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
41---------- Potter	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor.
42, 43---------- Pullman	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Very poor	Fair.
44---------- Randall	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor.
45, 46, 47---------- Springer	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
48----------	Fair	Good	Good	Good	Very poor	Very poor	Good	Very poor	Good.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1, 2, 3----------	0-6	Loam----------	CL	A-4, A-6	0	100	95-100	95-100	51-70	24-32	8-16
Acuff	6-48	Clay loam, sandy clay loam, loam.	CL	A-6, A-7-6	0	100	95-100	95-100	65-75	28-45	12-25
	48-80	Clay loam, sandy clay loam, loam.	CL	A-6, A-7-6	0	95-100	90-100	90-100	60-75	25-42	12-25
4----------	0-12	Fine sandy loam	SM, ML, SC, CL	A-4	0	100	98-100	94-100	36-60	<30	NP-10
Altus	12-65	Fine sandy loam, sandy clay loam.	SM, ML, SC, CL	A-4, A-6	0	100	98-100	90-100	36-65	<37	NP-16
5, 6----------	0-25	Silty clay loam	CL	A-7-6, A-6	0	100	98-100	90-100	51-90	30-45	12-28
Aspermont	25-45	Loam, silty clay loam, clay loam.	CL	A-7-6, A-6	0	100	95-100	80-98	51-95	30-45	12-28
	45-70	Silt loam, loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	95-100	85-100	51-95	25-45	8-30
7*:											
Berda----------	0-9	Loam----------	SC, CL, SM-SC, CL-ML	A-4, A-6	0-3	85-100	85-100	75-95	36-70	20-35	7-20
	9-60	Loam, clay loam, sandy clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6	0	85-100	85-100	75-95	40-75	20-35	7-20
Estacado----------	0-15	Loam----------	CL	A-6, A-4	0	95-100	95-100	55-100	51-90	25-40	8-20
	15-24	Clay loam, sandy clay loam.	CL	A-6, A-7-6	0	95-100	95-100	85-100	55-90	30-42	12-25

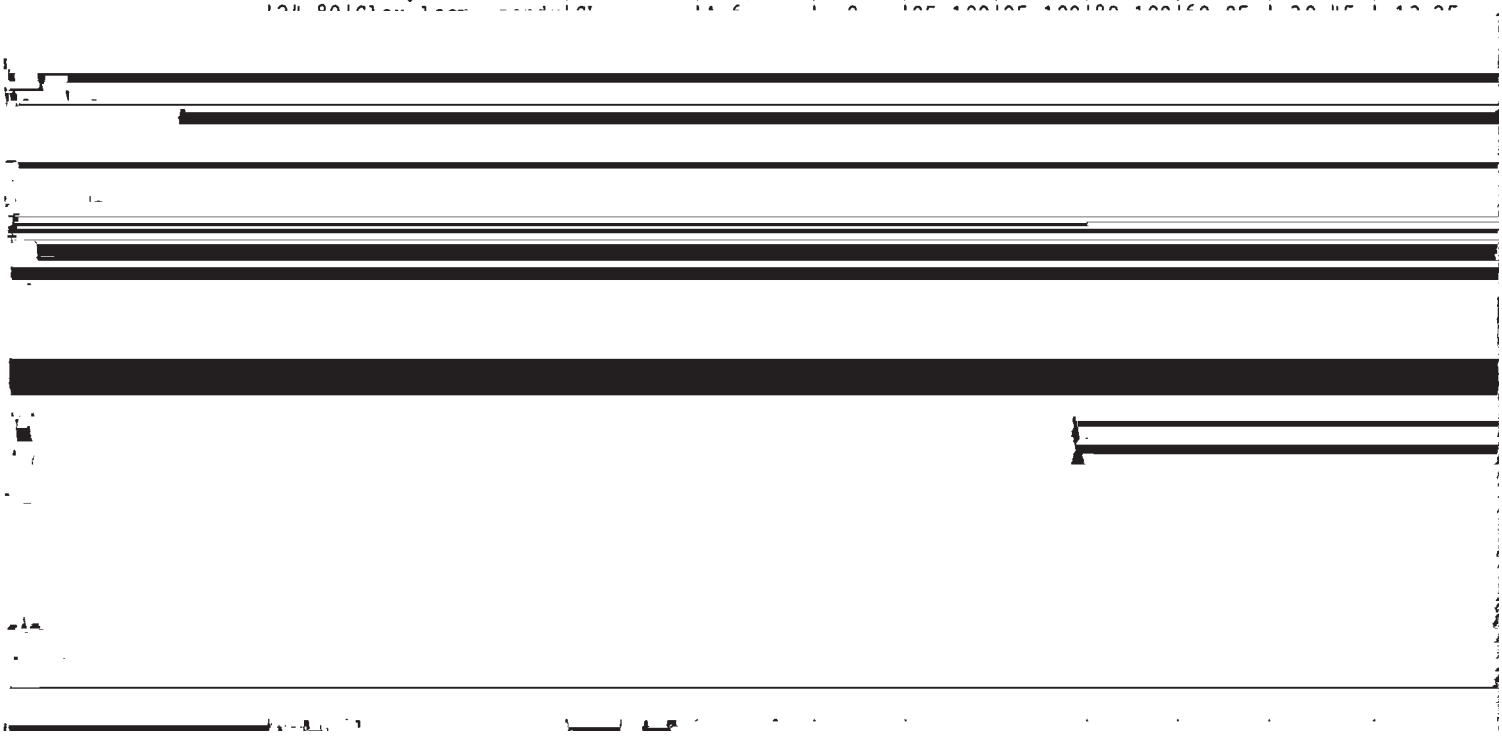

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
11*:											
Burson	0-6	Silt loam	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	50-85	18-30	3-12
	6-60	Weathered bedrock, variable.	---	---	---	---	---	---	---	---	---
Aspermont	0-25	Silty clay loam	CL	A-7-6, A-6	0	100	98-100	90-100	51-90	30-45	12-28
	25-45	Loam, silty clay loam, clay loam.	CL	A-7-6, A-6	0	100	95-100	80-98	51-95	30-45	12-28
	45-70	Silt loam, loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	95-100	85-100	51-95	25-45	8-30
12, 13	0-9	Loam	CL, ML,	A-4, A-6	0	100	98-100	90-100	51-90	20-32	3-15
		clay loam, loam.									
	55-80	Silt loam, loam, very fine sandy loam.	CL, ML, CL-ML, SM	A-4, A-6	0	100	90-100	85-100	44-85	20-35	3-12
14 Clairemont	0-65	Silt loam	CL, CL-ML	A-4, A-6	0	100	98-100	95-100	51-95	25-40	7-20
15 Delwin	0-15	Fine sand	SM, SM-SC, SP-SM	A-2-4, A-3	0	100	85-100	85-100	9-25	<24	NP-4

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
25, 26, 27, 28----- Miles	0-7	Fine sandy loam	SM, SM-SC, CL-ML, ML	A-2-4, A-4	0	95-100	90-100	80-98	25-55	18-25	2-7
	7-80	Sandy clay loam, clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6, A-2-4, A-2-6	0	95-100	90-100	90-98	30-72	20-40	4-22
29, 30, 31---------	0-60	Fine sandy loam	CL-ML, SM, ML	A-4,	0-5	90-100	90-98	80-95	30-65	18-25	2-7
32*: Mobeetie----------	0-60	Fine sandy loam	CL-ML, SM-SC, SM, ML	A-4, A-2-4	0-5	90-100	90-98	80-95	30-65	18-25	2-7
Badland.											
33*: Mobeetie----------	0-60	Fine sandy loam	CL-ML, SM-SC, SM, ML	A-4, A-2-4	0-5	90-100	90-98	80-95	30-65	18-25	2-7
Polar----------	0-7	Very gravelly sandy loam.	GM, SC, SM, SM-SC	A-1, A-2	0-2	50-90	30-60	25-50	15-30	<30	NP-11
	7-50	Very gravelly sandy loam, very gravelly loam, very gravelly loamy sand.	GC, SM, GM, GM-GC	A-1, A-2	0-2	45-80	25-50	15-45	10-25	<25	NP-8
34*: Mobeetie----------	0-60	Fine sandy loam	CL-ML, SM-SC, SM, ML	A-4, A-2-4	0-5	90-100	90-98	80-95	30-65	18-25	2-7
Veal----------	0-6	Fine sandy loam	SM, SC, SM-SC	A-2-4, A-4	0	90-100	85-100	70-98	30-50	15-25	3-10
	6-12	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0-2	85-100	80-100	80-100	40-80	22-40	7-20
	12-80	Clay loam, sandy clay loam, loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0-2	85-100	80-100	65-100	35-80	22-40	7-20
Potter----------	0-11	Loam----------	CL, CL-ML	A-4, A-6	0-5	70-95	70-95	60-85	51-70	20-40	5-20
	11-60	Variable--------	GC, SC, GM-GC, SM-SC	A-2-4, A-4, A-6, A-2-6	5-50	30-80	25-75	20-60	13-50	20-40	5-20
35---------- Nobscot	0-6	Fine sand-------	SM, SP-SM	A-2, A-3	0	100	98-100	82-100	5-35	---	NP
	6-27	Fine sand-------	SM, SP-SM	A-2, A-3	0	100	98-100	82-98	5-25	---	NP
	27-62	Fine sandy loam	ML, SM,	A-4	0	100	98-100	94-100	36-60	<30	NP-10

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
36*:											
Quinlan	0-12	Loam	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	55-97	<37	NP-14
	12-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
37, 38	0-6	Clay loam	CL	A-4, A-6	0	100	95-100	85-100	55-80	25-35	8-18
Olton	6-47	Clay loam, silty clay loam, clay.	CL	A-6, A-7-6	0	95-100	90-100	90-100	60-95	35-50	18-32
	47-80	Clay loam, sandy clay loam, loam.	CL	A-4, A-6	0	90-100	85-100	80-100	60-85	20-40	8-25
39, 40	0-12	Loam	CL, SC	A-4, A-6	0	95-100	95-100	80-95	40-75	20-35	8-20
Paloduro	12-60	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	80-95	40-75	20-35	8-20
41	0-11	Loam	CL, CL-ML	A-4, A-6	0-5	70-95	70-95	60-85	51-70	20-40	5-20
Potter	11-60	Variable	GC, SC, GM-GC, SM-SC	A-2-4, A-4, A-6, A-2-6	5-50	30-80	25-75	20-60	13-50	20-40	5-20
42, 43	0-6	Clay loam	CL	A-6, A-7-6	0	100	100	95-100	70-90	30-50	15-30
Pullman	6-44	Clay, silty clay	CL, CH	A-7-6	0	100	100	95-100	85-98	41-55	22-35
	44-80	Clay loam, clay, silty clay.	CL	A-6, A-7-6	0	95-100	90-100	80-100	75-95	30-50	15-30
44	0-75	Clay	CL, CH	A-7-6	0	100	100	95-100	75-98	41-70	22-45
Randall											
45, 46, 47	0-16	Loamy fine sand	SM, SP-SM, SM-SC	A-2-4, A-3	0	98-100	95-100	70-96	8-25	<22	NP-4
Springer	16-40	Fine sandy loam	SM, SM-SC	A-2-4	0	98-100	95-100	75-99	11-35	18-25	2-7
	40-48	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM, SM-SC	A-2-4, A-3	0	98-100	95-100	70-96	8-25	<22	NP-4
	48-72	Fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-4	0	98-100	95-100	75-99	11-45	18-25	2-8
48	0-16	Fine sandy loam	SM, SM-SC	A-2-4	0	98-100	95-100	75-99	11-35	18-25	2-7
Springer	16-40	Fine sandy loam	SM, SM-SC	A-2-4	0	98-100	95-100	75-99	11-35	18-25	2-7
	40-48	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM, SM-SC	A-2-4, A-3	0	98-100	95-100	70-96	8-25	<22	NP-4
	48-72	Fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-4	0	98-100	95-100	75-99	11-45	18-25	2-8
49	0-18	Clay loam	CL, CL-ML	A-4, A-6	0	100	95-100	90-100	51-95	25-45	7-25
Spur	18-60	Loam, clay loam, sandy clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0	100	95-100	90-100	45-95	22-45	7-25
50*	0-26	Clay loam	CL, CL-ML, SC	A-4, A-6	0	100	95-100	80-95	40-70	25-40	7-20
Sweetwater	26-60	Loamy fine sand, fine sand.	SM	A-2	0	95-100	90-100	50-80	15-35	<22	NP-2
51	0-6	Fine sand	SM, SP-SM	A-2, A-3	0	100	98-100	80-100	5-35	---	NP
Tivoli	6-60	Fine sand, sand	SM, SP-SM	A-2, A-3	0	100	98-100	80-98	5-20	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
52, 53---------- Veal	0-6	Fine sandy loam	SM, SC, SM-SC	A-2-4, A-4	0	90-100	85-100	70-98	30-50	15-25	3-10
	6-12	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0-2	85-100	80-100	80-100	40-80	22-40	7-20
	12-80	Clay loam, sandy clay loam, loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0-2	85-100	80-100	65-100	35-80	22-40	7-20

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group
						K	T	
	In	In/hr	In/in	pH				
1, 2, 3----------	0-6	0.6-2.0	0.12-0.18	6.6-7.8	Low----------	0.28	5	5
Acuff	6-48	0.6-2.0	0.14-0.19	7.4-8.4	Low----------	0.32		
	48-80	0.6-2.0	0.10-0.16	7.9-8.4	Low----------	0.32		
4----------	0-12	2.0-6.0	0.11-0.15	6.1-7.3	Low----------	0.24	5	3
Altus	12-65	0.6-2.0	0.11-0.17	6.6-8.4	Low----------	0.32		
5, 6----------	0-25	0.6-2.0	0.16-0.22	7.9-8.4	Moderate------	0.32	4	4L
Aspermont	25-45	0.6-2.0	0.12-0.18	7.9-8.4	Moderate------	0.32		
	45-70	0.6-2.0	0.10-0.18	7.9-8.4	Moderate------	0.32		
7*:								
Berda----------	0-9	0.6-2.0	0.14-0.18	7.9-8.4	Low----------	0.28	5	4L
	9-60	0.6-2.0	0.14-0.18	7.9-8.4	Low----------	0.28		
Estacado--------	0-15	0.6-2.0	0.14-0.19	7.9-8.4	Low----------	0.28	5	4L
	15-24	0.6-2.0	0.12-0.18	7.9-8.4	Low----------	0.32		
	24-80	0.6-2.0	0.10-0.18	7.9-8.4	Low----------	0.32		
Potter----------	0-11	0.6-2.0	0.10-0.16	7.9-8.4	Low----------	0.28	1	---
	11-60	0.6-6.0	0.-0.06	7.9-8.4	Low----------	---		
8*:								
Berda----------	0-9	0.6-2.0	0.14-0.18	7.9-8.4	Low----------	0.28	5	4L
	9-60	0.6-2.0	0.14-0.18	7.9-8.4	Low----------	0.28		
Potter----------	0-11	0.6-2.0	0.10-0.16	7.9-8.4	Low----------	0.28	1	---
	11-60	0.6-6.0	0.-0.06	7.9-8.4	Low----------	---		
Rock outcrop.								
9, 10----------	0-12	0.6-2.0	0.14-0.20	7.4-8.4	Moderate------	0.28	5	6
Bippus	12-80	0.6-2.0	0.14-0.20	7.9-8.4	Moderate------	0.28		
11*:								
Burson----------	0-6	0.6-2.0	0.10-0.16	7.9-8.4	Low----------	0.43	1	---
	6-60	---	---	---	----------	---		
Aspermont-------	0-25	0.6-2.0	0.16-0.22	7.9-8.4	Moderate------	0.32	4	4L
	25-45	0.6-2.0	0.12-0.18	7.9-8.4	Moderate------	0.32		
	45-70	0.6-2.0	0.10-0.18	7.9-8.4	Moderate------	0.32		
12, 13----------	0-9	0.6-2.0	0.15-0.20	6.6-7.8	Low----------	0.43	5	6
Carey	9-55	0.6-2.0	0.15-0.20	6.6-8.4	Low----------	0.43		
	55-80	0.6-2.0	0.10-0.18	7.9-8.4	Low----------	0.43		
14----------	0-65	0.6-2.0	0.16-0.22	7.9-8.4	Low----------	0.43	5	6
Clairemont								
15----------	0-15	6.0-20	0.04-0.10	6.1-7.3	Very low------	0.17	5	1
Delwin	15-80	0.6-2.0	0.12-0.16	6.6-8.4	Low----------	0.24		
16, 17, 18-------	0-15	0.6-2.0	0.14-0.19	7.9-8.4	Low----------	0.28	5	4L
Estacado	15-24	0.6-2.0	0.12-0.18	7.9-8.4	Low----------	0.32		
	24-80	0.6-2.0	0.10-0.18	7.9-8.4	Low----------	0.32		
19----------	0-34	2.0-6.0	0.10-0.15	7.9-8.4	Low----------	0.28	4	3
Guadalupe	34-65	2.0-6.0	0.06-0.10	7.9-8.4	Very low------	0.17		
20----------	0-66	2.0-6.0	0.04-0.10	7.4-8.4	Very low------	0.15	5	2
Likes								

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group
						K	T	
	In	In/hr	In/in	pH				
21----------	0-8	6.0-20	0.06-0.11	7.4-8.4	Low----------	0.17	5	2
Lincoln	8-60	6.0-20	0.02-0.08	7.9-8.4	Low----------	0.17		
22, 23, 24-------	0-7	2.0-6.0	0.06-0.10	6.6-7.8	Low----------	0.20	5	2
Miles	7-80	0.6-2.0	0.12-0.18	6.6-8.4	Low----------	0.32		
25, 26, 27, 28---	0-7	2.0-6.0	0.10-0.15	6.6-7.8	Low----------	0.24	5	3
Miles	7-80	0.6-2.0	0.12-0.18	6.6-8.4	Low----------	0.32		
29, 30, 31-------	0-60	2.0-6.0	0.10-0.14	7.9-8.4	Low----------	0.24	3	3
Mobeetie								
32*:								
Mobeetie--------	0-60	2.0-6.0	0.10-0.14	7.9-8.4	Low----------	0.24	3	3
Badland.								
33*:								
Mobeetie--------	0-60	2.0-6.0	0.10-0.14	7.9-8.4	Low----------	0.24	3	3
Polar-----------	0-7	2.0-6.0	0.05-0.09	7.9-8.4	Very low------	0.10	2	---
	7-50	2.0-6.0	0.03-0.08	7.9-8.4	Very low------	0.10		
34*:								
Mobeetie--------	0-60	2.0-6.0	0.10-0.14	7.9-8.4	Low----------	0.24	3	3
Veal------------	0-6	2.0-6.0	0.10-0.15	7.9-8.4	Low----------	0.24	4	3
	6-12	0.6-2.0	0.10-0.18	7.9-8.4	Low----------	0.28		
	12-80	0.6-2.0	0.10-0.15	7.9-8.4	Low----------	0.28		
Potter----------	0-11	0.6-2.0	0.10-0.16	7.9-8.4	Low----------	0.28	1	---
	11-60	0.6-6.0	0.-0.06	7.9-8.4	Low----------	---		
35----------	0-6	6.0-20.0	0.07-0.11	5.6-7.3	Low----------	0.17	5	1
Nobscot	6-27	6.0-20.0	0.05-0.08	5.6-7.3	Low----------	0.17		
	27-62	2.0-6.0	0.11-0.15	5.1-6.5	Low----------	0.20		
	62-80	2.0-6.0	0.05-0.11	6.1-7.3	Low----------	0.17		
36*:								
Obaro-----------	0-32	0.6-2.0	0.14-0.20	7.9-8.4	Low----------	0.43	3	4L
	32-60	---	---	---	----------	---		
Quinlan---------	0-12	2.0-6.0	0.15-0.20	7.4-8.4	Low----------	0.32	2	5
	12-60	---	---	---	----------	---		
37, 38----------	0-6	0.6-2.0	0.15-0.20	6.6-8.4	Moderate------	0.32	5	6
Olton	6-47	0.2-0.6	0.14-0.19	7.4-8.4	Moderate------	0.32		
	47-80	0.2-0.6	0.10-0.16	7.9-8.4	Moderate------	0.32		
39, 40----------	0-12	0.6-2.0	0.15-0.20	7.9-8.4	Low----------	0.28	5	6
Paloduro	12-60	0.6-2.0	0.12-0.18	7.9-8.4	Low----------	0.28		
41----------	0-11	0.6-2.0	0.10-0.16	7.9-8.4	Low----------	0.28	1	---
Potter	11-60	0.6-6.0	0.-0.06	7.9-8.4	Low----------	---		
42, 43----------	0-6	0.2-0.6	0.14-0.19	6.6-8.4	Moderate------	0.37	5	6
Pullman	6-44	<0.06	0.12-0.17	7.4-8.4	High----------	0.37		
	44-80	0.06-0.2	0.10-0.16	7.9-8.4	Moderate------	0.37		
44----------	0-75	<0.06	0.12-0.18	7.4-8.4	Very high-----	0.32	5	4
Randall								
45, 46, 47-------	0-16	6.0-20.0	0.06-0.10	6.6-7.8	Very low------	0.17	5	2
Springer	16-40	2.0-6.0	0.10-0.15	6.6-8.4	Low----------	0.20		
	40-48	6.0-20.0	0.06-0.10	6.6-8.4	Very low------	0.20		
	48-72	0.6-6.0	0.10-0.16	6.6-8.4	Low----------	0.20		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and	Depth	Permea-	Available	Soil reaction	Shrink-swell	Erosion factors	Wind

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
1, 2, 3---------- Acuff	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
4---------- Altus	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
5, 6---------- Aspermont	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
7*:											
Berda----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Estacado--------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Potter----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
8*:											
Berda----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Potter----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Rock outcrop.											
9, 10---------- Bippus	B	None to rare.	Very brief	Apr-Oct	>6.0	---	---	>60	---	Moderate	Low.
11*:											
Burson----------	C	None--------	---	---	>6.0	---	---	3-12	Rippable	Low------	Low.
Aspermont--------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
12, 13---------- Carey	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
14---------- Clairemont	B	Occasional	Very brief	Apr-Nov	>6.0	---	---	>60	---	Moderate	Low.
15---------- Delwin	A	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
16, 17, 18-------- Estacado	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
19---------- Guadalupe	B	Occasional	Very brief	Apr-Sep	>6.0	---	---	>60	---	Low------	Low.
20---------- Likes	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
21---------- Lincoln	A	Frequent----	Very brief to brief.	Apr-Oct	5.0-8.0	Apparent	Nov-May	>60	---	Low------	Low.
22, 23, 24, 25, 26, 27, 28------- Miles	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
29, 30, 31-------- Mobeetie	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
32*:											
Mobeetie---------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
Badland.											

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
33*: Mobeetie	B	None	---	---	>6.0	---	---	>60	---	Low	Low.
Polar	B	None	---	---	>6.0	---	---	>60	---	Low	Low.
34*: Mobeetie	B	None	---	---	>6.0	---	---	>60	---	Low	Low.
Veal	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
Potter	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
35--- Nobscot	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
36*: Obaro	B	None	---	---	>6.0	---	---	20-40	Ripable	Low	Low.
Quinlan	C	None	---	---	>6.0	---	---	10-20	Ripable	Moderate	Low.
37, 38--- Olton	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
39, 40--- Paloduro	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
41--- Potter	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
42, 43--- Pullman	D	None	---	---	>6.0	---	---	>60	---	High	Low.
44--- Randall	D	Common	Long to very long.	May-Nov	>6.0	---	---	>60	---	High	Low.
45, 46, 47, 48--- Springer	B	None	---	---	>6.0	---	---	>60	---	Low	Low.
49--- Spur	B	Occasional	Very brief	Apr-Oct	>6.0	---	---	>60	---	Moderate	Low.
50*--- Sweetwater	D	Common	Brief	Apr-Oct	0.5-3.0	Apparent	Jan-Dec	>60	---	High	Low.
51--- Tivoli	A	None	---	---	>6.0	---	---	>60	---	Low	Low.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Acuff	Fine-loamy, mixed, thermic Aridic Paleustolls
Altus	Fine-loamy, mixed, thermic Pachic Argiustolls
Berda	Fine-loamy, mixed, thermic Aridic Ustochrepts
Bippus	Fine-loamy, mixed, thermic Cumulic Haplustolls
Burson	Loamy, mixed (calcareous), thermic, shallow Ustic Torriorthents
Carey	Fine-silty, mixed, thermic Typic Argiustolls
Clairemont	Fine-silty, mixed (calcareous), thermic Typic Ustifluvents
Delwin	Fine-loamy, mixed, thermic Udic Paleustalfs
Estacado	Fine-loamy, mixed, thermic Calciorthidic Paleustolls
Guadalupe	Coarse-loamy, mixed, thermic Fluventic Ustochrepts
Likes	Mixed, thermic Typic Ustipsamments
Lincoln	Sandy, mixed, thermic Typic Ustifluvents
Miles	Fine-loamy, mixed, thermic Udic Paleustalfs
Mobeetie	Coarse-loamy, mixed, thermic Aridic Ustochrepts
Nobscot	Loamy, mixed, thermic Arenic Paleustalfs
Obaro	Fine-silty, mixed, thermic Typic Ustochrepts
Olton	Fine, mixed, thermic Aridic Paleustolls
Paloduro	Fine-loamy, mixed, thermic Aridic Haplustolls
Polar	Loamy-skeletal, mixed, thermic Ustollic Calciorthids
Potter	Loamy, carbonatic, thermic, shallow Ustollic Calciorthids
Pullman	Fine, mixed, thermic Torrertic Paleustolls
Quinlan	Loamy, mixed, thermic, shallow Typic Ustochrepts
Randall	Fine, montmorillonitic, thermic Udic Pellusterts
Springer	Coarse-loamy, mixed, thermic Udic Paleustalfs
Spur	Fine-loamy, mixed, thermic Fluventic Haplustolls
Sweetwater	Fine-loamy over sandy or sandy-skeletal, mixed (calcareous), thermic Fluvaquentic Haplaquolls
Tivoli	Mixed, thermic Typic Ustipsamments
Veal	Fine-loamy, carbonatic, thermic Aridic Ustochrepts

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